Chapter 4

USFWS

Eastern B-Pool during spring, prior to draw-down for shorebird feeding

Management Direction and Implementation

- Introduction
- Goals, Objectives, and Strategies
- Other Management Activities

Introduction

This chapter is in two parts. In combination, the chapter describes the array of management objectives that, in our professional judgement, work best toward achieving the refuge purposes, the vision and goals developed during the planning process, and the goals and objectives of other Service, State and regional conservation plans. We believe in implementing these actions will also effectively address the key issues raised during plan development.

The first part, "Goals Objectives an Strategies," describes refuge actions that were developed to achieve specific goals and objectives.

The second part, "Other Management Activities", describe refuge actions that were common to all the alternatives in the draft CCP/EA and will be implemented on the refuge

Some strategies do not specifically interconnect with any of the seven goals developed for the CCP. For example, the strategies and actions related to cultural, archaeological and historic resources may not fit under habitat or public use goals, but are important nonetheless.

Goals, Objectives, and Strategies

GOAL 1. **Maintain and enhance the biological integrity and diversity of wetland habitats for migratory birds including species of conservation concern.**

Objective 1a. Impoundments- Migrating/Over-wintering Waterfowl and Migrating Shorebirds

- Manage 906 acres of 13 freshwater impoundments at Back Bay NWR, plus 165 acres of two freshwater impoundments at False Cape State Park, to meet the habitat needs of migrating and wintering waterfowl and shorebirds. This objective shall be aimed at providing quality habitat that maintain or increase existing levels of migratory waterfowl and shorebird use. Acreage and location of each habitat type may vary from one impoundment to another from year to year, depending upon the wetland dynamics, vegetation management, and plant successional changes that occur within each impoundment. Management efforts would be directed to provide approximately the following habitats each year:

- Emergent Marsh (Spring: March – April): Provide approximately 400 acres (on both the Refuge and False Cape State Park) of shallow, flooded (6”-18” water depth), mixed annual and perennial marsh vegetation remnants of the previous growing season. These relatively open-water habitats shall serve as both resting/roosting and feeding areas for migrating waterfowl.

- Shallow Water Mudflats (Spring: Late April – May): Provide approximately 350 acres (on both the Refuge and False Cape State Park) of feeding habitat for migrating shorebirds. Consisting of shallow water (<4” deep) to mudflat habitat with sparse to no vegetation (<15% coverage), during the normal peak shorebird migration of early to mid-May. This habitat would consist of a minimum of 10 patches; each 5-80 acres . 180 acres should consist of shallow water wetlands (0"- 3" deep) interspersed with exposed, wet mud/sand flats. Encourage the production of invertebrates for shorebird food at a density of 4 grams of invertebrates per square meter.

- Emergent Marsh (Summer: July – Aug.): Provide a minimum of 200 acres of high quality feeding habitat for wading and marsh birds. This habitat would consist of open, shallow water (2”-10" deep) with patches of emergent wetland plants that support fish, invertebrates and amphibians. Said habitat should be

provided in a minimum of 4-6 patches of at least 50 acres each. Highest quality areas are those patches where prey is concentrated following water drawdown.

- Shallow Water Mudflats (Fall: Late Aug. – Sept.): Provide approximately 200 acres of feeding habitat for migrating shorebirds. Consisting of shallow (<15cm) water depth to mudflat habitat, with sparse to no vegetation (<15% coverage), during the normal peak shorebird migration of early September. Patch size shall be a 5-80 acres each although patch availability changes between spring & fall together with patch location.

- Emergent Marsh (Fall: Late Aug. – Oct.): Provide approximately 350 acres of feeding and resting habitats for migrating waterfowl. Habitats shall consist of shallow flooded (<12" water depth) marshes with vegetation dominated principally by large-seeded perennial, and smaller seeded annual, marsh plants (e.g. sedges, rushes, smartweeds, and threesquare, mixed with smaller areas of moist-soil annual plants, beggar's ticks, wild millets, water hyssop, bulrushes and submerged aquatic vegetation. Patch sizes shall be at least 15-20 acres.

- Wetland Mosiac (Wintering: Nov. – Feb.): Provide approximately 830 acres (on both the Refuge and False Cape State Park) of feeding and resting habitats for waterfowl. These areas shall consist of approximately 750 acres of emergent marshes, moist soil units and shallow open-water areas; plus an additional 80 acres of deeper, open-water habitat with submerged aquatic vegetation for diving waterfowl.

- Emergent Marsh-Cattail, Needlerush, Bulrush (Year-round): Provide approximately 450 acres (on both BBNWR & FCSP) of feeding, nesting and resting habitat for rails, bitterns and the common moorhen. Habitats shall consist of dense (>80% coverage), robust vegetation (cattail, needlerush and bulrushes) that occurs in patch sizes of at least 25 acres. Water depths during the breeding season shall range between 0"– 12".

Strategies:
Continue to:

- Annually provide at least 325 acres of quality waterfowl stopover and wintering habitat, consisting of shallow, flooded wetlands (6"-18" water), dominated principally by large-seeded, perennial marsh vegetation, with some mixed, fine-seeded annuals.

- Annually provide at least 350 acres of quality waterfowl stopover and wintering habitat consisting of shallow, flooded wetlands (<7" water), dominated principally by mixed large and fine seeded, annual, moist-soil vegetation, with some perennials.

- Annually provide at least 60 acres of open, deeper-water (>1.5') wintering habitat for such diving ducks as the lesser scaup, ruddy duck, bufflehead, hooded merganser, coot and pied-billed grebe.

- Annually provide a minimum of 6 patches of feeding and roosting habitat at least 20 acres in size, for migrating shorebirds. These habitats should consist of wetlands where shallow (0"- 4") water and wet sand/mud flats make up the majority of the area.

- Each summer (July and August) provide a minimum of 350 acres of quality feeding habitat for wading and marsh birds. This habitat shall consist of an average mix of open, shallow water, with patches of emergent marsh plants, with an average water depth of 4"- 5". This habitat should be provided

in a minimum of four patches of at least 50 acres each that support good populations of fish, insects and amphibians.

- Year-round, provide a minimum of 25 acres of "watchable wildlife" habitat for the visiting public during the winter impoundments' closure period. "Watchable wildlife" species include the snow goose, ducks, herons, egrets and ibis.

- Provide a minimum of 10 acres of quality fresh-water, year-round, fishing habitat, consisting of an average 60% mix of vegetation and open water with an average water depth of 2'- 3'. This fresh-water habitat should support viable populations of bluegill, pickerel, large-mouth bass and sunfish.

- Annually provide at least 250 acres of mixed stands of black needlerush and phragmites reed to continue supporting existing breeding populations of least bitterns; and as spring migration stop-over habitat for the Sora rail and bitterns in North Bay Marshes.

- Minimize use of the impoundments by competing non-migratory wildlife such as the resident Canada goose, feral pig, nutria and feral horse. Since these species also consume large amounts of young wetland plants meant to provide wintering waterbirds with food during their fall migration and winter, resident species' use of Refuge impoundments presents a direct conflict with impoundment management objectives and must be curtailed where possible. Resident Canada goose numbers may be reduced by shooting and egg addling during their nesting season. The feral pig and nutria may be controlled by shooting/hunting and trapping. The feral horse may be controlled by capturing and transporting horses to North Carolina, with the support of local citizens and the Corolla Horse Association.

- Conduct waterbird surveys in the impoundments up to three times per month to determine if impoundment objectives aimed at sustaining moderate numbers of migrating and wintering waterbirds are being met.

- Close dikes to public access from November through March to reduce public disturbance to wintering waterfowl.

- Conduct ground surveys of vegetation in three larger impoundments once a year to assess waterfowl food production and monitor invasive species distributions.

- Annually treat (disk and/or burn) up to 250 acres of the total 1,130 acres of the main impoundments, including False Cape State Park's two impoundments and 26 acres at the Carter impoundment.

- Gradually flood for waterfowl during winter; draw-down for shorebirds and waterfowl during spring and fall migrations; and extreme draw-down for wading birds during mid-summer.

- Provide maximum beneficial waterbird food-plant and invertebrate production, by draw-downs of moist soil units during spring; exposing substrates of the eastern sections of impoundments. Maintain wet soils in those eastern areas throughout growing season.

- Remove brush (principally recurring waxmyrtle) that is too large to bush-hog. by root-raking. Live oaks would be allowed to remain.

- Mow herbaceous and grassy, dense perennial vegetation. Follow with flooding to provide wintering waterfowl access to rootstocks. May be an occasional substitute for prescribed burning; but does not remove undesirable seed-stock.

- Provide water to the East and West False Cape State Park (FCSP) impoundments via two water control structures in the Refuge south dike of A-Pool.

In addition:

- Hunting. Remove as many feral hogs and white-tailed deer as possible from the 880 acre impoundment complex. Both compete for food raised by Refuge management actions for wintering and migrating waterbirds. Consider increasing hunting season(s) if practical.

- Develop an Adaptive Management Framework for phragmites control so that treatments are monitored and evaluated for effectiveness. The refuge will be using an integrated approach to phragmites control, which will consider restoration of natural processes, herbicides, prescribed burning, and other tools as they are developed.

- Consistent, annual control through use of EPA-approved systemic herbicides (for use in wetlands). Herbicide applications shall occur via aerial and/or backpack spraying. Expanded aerial control efforts would focus on larger stands, while backpack spraying would be used to treat remaining small patches.

- Work with cooperating private property partners to treat areas on land adjacent to Refuge lands that have dead phragmites stands from prior control efforts. This would require the formation of new Refuge partnerships and written agreements.

- Increase feral hog control efforts through additional advances in the cooperative research effort with VDGIF. Additional efforts may include: permitting selected trappers to run traps for year-round feral hog population control as needed through Special Use Permits; working with State biologists to assess Refuge feral pig population through a mark-recapture, ear-tagging program; increased shooting by Refuge staff or permitting sharpshooters; and/or increasing public hunting opportunities.

- Cattail – When cattail presence exceeds 50% of the cover within the impoundment, control is warranted. Control would consist of mowing/burning and subsequent flooding.

- Feral Cats – Control feral cats when they are spotted on the Refuge by lethal means (i.e., shooting with small caliber rifle or shotgun) or by trapping.

- Feral Horses – Work with Currituck NWR and False Cape State Park to effectively and cooperatively manage feral horses. In addition, work with the Virginia Wild Horse Rescue round-up and remove horses to remove horses when contacted by Refuge personnel or Sandbridge residents.

Monitoring Elements

Conduct appropriate monitoring and survey programs as funding and staffing permits to measure our success with respect to our objectives. The results may trigger adjustments to management strategies, or a reevaluation or a refinement

of our objectives. Examples of monitoring or surveys that we may implement include:

- Prevent new invasive species from becoming established within the freshwater impoundments by utilizing Early Detection Rapid Response Techniques that detect newly established invasive species and immediately addresses those populations through the appropriate control measure. This will incorporate a combination of plant identification and inventories, maintaining updates of new invasive species present in the region, as well as having knowledge of the appropriate management techniques prior to conducting control efforts.

- Monitor and evaluate waterfowl, shorebirds, and wading birds use of intensively managed Refuge habitats. These surveys will determine whether the Refuge is maintaining or improving shorebird and waterfowl use during the spring and fall migrations; wading bird use during the late summer and fall; and wintering waterfowl use.

- Continue to conduct callback surveys for secretive marsh birds to monitor overall diversity, evaluate habitat use patterns and identify potential areas for habitat protection of enhancement projects.

- Implement Service-approved monitoring techniques, where appropriate, in keeping with Regional and National protocols and other standards.

- Conduct vegetation surveys to determine when cattail presence exceeds 50%. Monitor presence of Canada geese, feral hogs, and feral cats and control these species as necessary to protect refuge resources.

Objective 1b. Wetland Biological integrity (Emergent Oligohaline Marsh & Open Water Coves)

Restore, enhance and maintain biological integrity of native wetland plant communities throughout the impoundment complex and up to 4,000 acres of wetlands within Refuge islands and the Back Bay watershed so that forested wetland habitats are restored, submerged aquatic vegetation (ie. Sago pondweed, wild celery, southern niad/bushy pondweed, widgeon grass, redhead grass, muskgrass and nitella) is restored to >50 stems per acre in 40% of open-water habitats for wintering/migrating waterfowl. In addition, water quality levels are improved to good to excellent based on Virginia Department of Environmental Quality standards. Benefiting species include migrating/wintering waterfowl (e.g. Gadwall, American widgeon, American coot, American black duck and Tundra swan), migrating and breeding marshbirds (e.g., Least bittern, King rail, and Pied-billed grebe), and migrating shorebirds (e.g. Short-billed dowitcher, Lesser yellowlegs, Semipalmated sandpiper).

Rationale

One of the establishing purposes of the refuge is to protect and conserve wetlands. Eighty percent of America's breeding population and more than 50 percent of its 800 species of protected migratory birds rely on wetlands (Mitsch and Gosselink 1993, citing Wharton, et al. 1982). Over 95 percent of the commercially harvested fish and shellfish species are wetland-dependent. Most freshwater fish depend on wetlands for spawning, and anadromous fish rely on them as nurseries for young fry. Wetlands also provide essential ecosystem functions that technology has yet to rival such as flood mitigation (especially riverine wetlands), storm abatement and filtering and removing nutrients and toxic material. Wetlands also are significant for global cycles of nitrogen, sulfur, methane and carbon dioxide (Mitch and Gosselink 1993).

The several distinct types of wetland habitat on the Refuge include:

- Freshwater emergent marsh (also known as palustrine emergent wetlands);
- Freshwater wooded swamp (also known as forested wetlands, dominated by trees or shrubs);
- Riparian forested wetlands (along the lowland margins and also known as bottomland hardwood forest) which receive only occasional flooding from adjacent waterways, but may also flood from heavy rains and sheet-flow from adjacent uplands.
- Open-water coves, ponds and potholes (commonly found within bottomland forests, bay islands and emergent marshes. Often these harbor dense concentrations of submerged aquatic vegetation, which in turn attract fish and waterfowl.

Freshwater marshes are composed of emergent vegetation such as narrow-leaved cattail, black needlerush, big cordgrass, pickerelweed, arrowheads, bulrushes and spikerushes. Salinity levels seldom exceed 3.0 parts per thousand, and are often in the 2.0-2.5ppt vicinity. They host priority birds such as the American black duck, pintail, wood duck, mallard, green and blue-winged teal, common snipe, solitary sandpiper, spotted sandpiper, marsh and sedge wrens (a species of high priority in the BCR30 Plan), American bittern, least bittern, sora rail and king rail. Forster's and royal terns forage in the associated open waters in summer. Those areas contain most of the important nursery and spawning habitat for several important fish species that, in turn, provide an important food source for herons, eagles, ospreys and fish-eating waterfowl. During winter hundreds to thousands of Tundra swans, gadwalls, widgeon, coots, scaup and redhead ducks feed over beds of submerged aquatic vegetation.

Refuge forested wetlands or wooded swamps are described in the Forest Management section (Objective 2.c). below. Vegetation in these wetlands can withstand long periods of root zone saturation during the growing season. They support such priority bird species as the Louisiana and Northern waterthrushes, Prothonotary warbler, Worm-eating warbler, Red-headed woodpecker, Black duck and Wood duck.

Riparian forests have shorter periods of flooding and support forest species that are similar to those in higher elevation forests. For that reason, we discuss the objectives, rationale, and strategies for this community type separately in Objective 2c below.

Controlling and preventing the spread of invasive plants, particularly Common reed (Phragmites australis), is an essential component of wetland protection and management in the Atlantic coastal states. It spreads rapidly, displaces native vegetation and gradually raises the height of the marsh floor, altering the hydrology of the marsh. That poses a conservation threat to wetland-dependent fish and wildlife species that evolved with the historic vegetative communities that provide food, nest substrate, spawning habitat, or cover at different times in their annual life cycles. The Refuge Phragmites control program has been a long-standing one that has expanded greatly during the past 3 years.

All Refuge lands that border wetlands or open water now have at least 100-foot buffers in grassland or woody vegetation; but much more of the Back Bay Watershed remains that needs buffering and protection within the entire refuge acquisition boundary. Water quality protection is a principal concern of the Refuge.

Protecting large blocks (>50 acres) of all types of wetland habitat in the Refuge will improve the success of nesting, foraging, and resting wetland-dependent species, including the American black duck, seaside sparrow, marsh and sedge wrens, mallard, northern pintail, wood duck, least bittern, king, Virginia and sora rails, common snipe, as well as the blue and green-winged teal. Forested swamp species will also benefit, such as the prothonotary warbler, Louisiana waterthrush, red-headed woodpecker, and bald eagle (which nest in woodland edges) and are all identified in the BCR 30 plan and the VA Wildlife Action Plan.

Strategies:

Continue to:

Control pests other than phragmites including non-native, invasive species and other pest plants and animals in Refuge wetlands.

- Japanese stiltgrass. Use Sethoxydim herbicide, or other suitable herbicide, to control Japanese stiltgrass, starting in the Refuge headquarters vicinity. However, the feasibility of successfully controlling this pest plant that has become so entrenched throughout the Refuge is still under review. Limited control in higher priority areas may be the only feasible solution.

- Nutria. Draw down water levels in the impoundments in the spring and summer and flood the impoundments during the fall and winter to minimize nutria habitat.

- American lotus. Draw-down impoundment water level to dry out affected areas and eliminate year-round, stable water depths that are conducive to American lotus. (Currently testing in C-Pool and the North and East Frank Carter/ Colchester impoundments).

- Johnson grass. Apply Round-up (Glyphosate) herbicide to plants by agricultural tractor equipped with spray tank and booms.

- Monitoring invasive plants, such as Vitex rotundifolia, which are present near the Refuge border and which may spread onto the Refuge under suitable conditions.

- Resident Canada goose. Addle impoundment resident Canada geese eggs by shaking, spraying with cooking oil or puncturing to reduce reproduction.

- Selectively control individual resident Canada geese by lethal means (i.e., shooting with small caliber rifle or shotgun) during their April-June breeding season.

Feral Hogs

- State and federal biologists would continue their research of feral hog populations including feasability of trapping.

- Conduct a feral hog hunt to control population levels.

Nutria

- Draw down water levels in the impoundments in the spring and summer and flood the impoundments during the fall and winter to minimize nutria habitat.

Feral Cat

- Control feral cats when they are spotted on the Refuge by lethal means ((i.e., shooting with small caliber rifle or shotgun)or by trapping.

Feral Horses

- Have the Virginia Wild Horse Rescue round-up and remove horses when contacted by Refuge personnel or Sandbridge residents.

- Work with Currituck NWR and FCSP to effectively and cooperatively manage the issue.

Within 2 years of CCP approval:

- Develop an Adaptive Management Framework for phragmites control so that treatments are monitored and evaluated for effectiveness. The refuge will be using an integrated approach to phragmites control, which will consider restoration of natural processes, herbicides, prescribed burning, and other tools as they are developed.

- Develop partnerships with Virginia Department of Environmental Quality and local agencies (e.g., Back Bay Restoration Foundation) to collect water quality data that would result in a scientifically sound water quality database for Back Bay and its tributaries. Data from this database would be used to provide the Refuge with sound baseline data for existing Back Bay water quality standards.

Within 3 years of CCP approval:

- Evaluate and determine existing and historic SAV species and distributions of Back Bay.

- Determine SAV restoration potential and implementation in Back Bay.

- Improve the plant diversity of 250 acres of freshwater wetlands within the western and northern marshes (and adjacent lands) around Back Bay (on or off Refuge), by increasing annual plan (smartweeds, Beggars ticks, wild millets, bacopa, and a variety of bulrushes and sedges) production. Such increased annual plant production would occur through a combination of decreasing phragmites reed density/presence in those areas through aerial applications and subsequently prescribe-burning Refuge marshes in previously described geographic locations.

Within 5 years of CCP approval:

- Convert 30 to 40 acres of old field in Tract 194 (adjacent to Muddy Creek Road) to a shallow, freshwater impoundment for migratory waterfowl and shorebirds.

- Establish an effective and scientifically-sound, interagency water quality monitoring program within the Back Bay watershed to establish sound baseline water quality data, and insure that negative impacts to Back Bay's water quality are detected as soon as possible.

Monitoring Elements

- Prevent new invasive species from becoming established within the freshwater impoundments by utilizing Early Detection Rapid Response Techniques that

detect newly established invasive species and immediately addresses those populations through the appropriate control measure. This will incorporate a combination of plant identification and inventories, maintaining updates of new invasive species present in the regin, as well as having knowledge of the appropriate management techniques prior to conducting control efforts.

- Establish a long-term SAV monitoring and management program in Back Bay to document SAV distribution.
- To determine water quality within Refuge impoundments and open water, monitor salinity, dissolved oxygen, turbidity, and pH.
- Conduct aerial monitoring of wintering waterfowl use and abundance in SAV and emergent wetland habitats. Utilize data to document the effectiveness of management activities and adjust management protocols as necessary.
- Insert Vegetation Monitoring Element to make sure the refuge meets objective of >50 stems per acre in 40% of open-water habitats for SAV
- To evaluate quality of wetlands for waterfowl, marshbirds, and shorebirds conduct periodic vegetation surveys for plant species composition, and community structure.

Goal 2:

Enhance and preserve the biological integrity and diversity of native woodlands to support native wildlife and plant communities including species of conservation concern.

Objective 2a. Shrub-Scrub Habitat (Maritime Upland Forest Edges and "Green Hills" Edges)

Within 6 years of CCP approval, provide 90 acres of shrubby, mid-story canopy in woodlands to the north and south of Sandbridge Road, east of Muddy Creek Road and the old field area of Long Island, to benefit declining migratory landbird species(e.g. Prairie warbler, Field sparrow, Brown-headed nuthatch and Eastern wood peewee) and breeding Yellow-crowned night heron. Native shrub species such as waxmyrtle, blueberry, inkberry, gallberry, and yaupon will be planted or encouraged to volunteer where parent plants exist.

Rationale

Shrub-dependent species are another rapidly declining bird group due to loss of habitat. Refuge shrub-scrub habitats are comprised of various shrub species, or a diverse mix of young trees. They provide an abundance of insect food for breeding birds, which need large amounts of protein for reproduction and feeding their young. Many shrub species also bear fruit in the fall, which helps boost the fat reserves for migrating or over-wintering birds. The structural density in this habitat type also provides cover from predators and shelter from harsh weather. Shrubby, early succession patches in close proximity to interior forest breeding territories are also important for survival of fledgling forest birds; these fledglings can feed on the abundant food sources in the dense foliage, in relative safety from predators.

In addition to being transitional in nature, shrub habitats are quickly disappearing because of agricultural practices and increased development pressures. Shrub-dependent birds will be forced to rely more heavily on intentional provisions of this habitat type by land managers.

The Eastern wood pee-wee and Prairie warbler favor early succession forests and shrubby habitats where they can glean insects, especially leaf-eating caterpillars in the treetops and hide their nests in the foliage. The Field sparrow,

a year-round resident of the Refuge, favors old-field/forest edges where woody encroachment, tall forbs, vines and shrubs are well represented in an otherwise open habitat. It builds its nests low to the ground in young saplings or shrubs. That scenario frequently appears in landscapes containing a mosaic mix of field and forest or in regenerating, cut-over areas. The Chuck-will's-widow is also relatively common.

The vegetation structure and food supplies provided by shrub habitats benefit other species such as the Palm and Blackpoll warblers and Willow flycatcher, that use the refuge during migration; together with breeding Yellow-breasted chats, Blue Grosbeaks, Indigo buntings and Gray catbirds. Minimum patch sizes would vary according to habitat quality (vegetation density), landscape and surrounding vegetation.

Impoundments not meeting waterfowl/shorebird management goals or objectives may be permitted to revert to shrub-scrub.

Strategies

Continue to:

- Allow shrub-scrub growth in areas not detrimental to moist soil management or other Refuge objectives (i.e. permitting pond to revert to shrub-scrub).
- Maintain, where possible, shrub-scrub habitats in that state of plant succession by culling larger trees or removing tree tops.
- Revert up to 20 acres of former agricultural field over the next 5 years to shrub-scrub habitat.

Within 2 years of CCP approval:

- Reclaim old fields that have naturally succeeded to an early forest habitat stage, using tree pruners and chain-saws to remove the tops of the taller trees adjacent to Sandbridge and Muddy Creek Roads.
- Prescribe burn these areas if possible to reduce ground litter accumulations and encourage forb and shrub growth.
- Thin tree densities and remove tree tops to prevent succession to a forested community. Tree tops should not exceed 7 feet in height.
- Replace dead shrubs if more than 30% of planted shrubs have died. Volunteers and YCCs can conduct these surveys.

Monitoring Elements

Conduct appropriate monitoring and survey programs as funding and staffing permits to measure our success with respect to our objectives. The results may trigger adjustments to management strategies, or a reevaluation or a refinement of our objectives. Examples of monitoring or surveys that we may implement include:

- Prevent new invasive species from becoming established within the freshwater impoundments by utilizing Early Detection Rapid Response Techniques that detect newly established invasive species and immediately addresses those populations through the appropriate control measure. This will incorporate

a combination of plant identification and inventories, maintaining updates of new invasive species present in the region, as well as having knowledge of the appropriate management techniques prior to conducting control efforts.

- To evaluate achievement of the objective for breeding and migrating priority passerine species establish landbird surveys and migration counts.
- Shrub plantings should be surveyed annually (May or June) for 3 years, or until well established.
- To evaluate the effectiveness of prescribed burning conduct post-burn surveys to measure the area, the intensity, and the success of the burn.

Objective 2b. Shrub-Scrub Habitat (Estuarine Fringe Swamp Forest, Maritime Dune Scrub): Songbird Nesting and Migration

Provide a minimum of 500 acres of existing maritime dune shrub-scrub consisting of a mixture of thick shrub (e.g., waxmyrtle, saltbush/high-tide bush, inkberry and cherry) and forbs (e.g., switchgrass, vines, blackberry canes, greenbrier, goldenrods). These habitats provide critical songbird nesting and migrating habitats for the listed priority shrubland species (e.g. Prairie warbler, Field sparrow, Brown-headed nuthatch, Eastern wood-peewee, and Yellow-crowned night heron) along the wooded shorelines of the Back Bay Watershed and the western side of oceanfront dunes.

Rationale

In addition to the Prairie warbler and Field sparrow, the Eastern towhee and Brown thrasher prefer the drier, shrubby habitats typically found along forest and sand dune edges within the barrier island portions of the Refuge. In these areas, the denser and more diverse vegetation offers a variety of fruits, nuts, and insects to many declining passerines. Such habitats, located behind coastal sand dunes, are naturally in shrub cover due to their proximity to the Atlantic Ocean's salt-air, wind-pruning effects that prevents tree or shrub growth above dune-top elevations. Most of these habitats already exist and need only routine, annul visual checks to insure that no significant shrub mortality is occurring.

Strategies

- Protect from mechanical clearing (i.e., root raking) or other forms of removal/ destruction, particularly along western sides of ocean-front dunes.
- Where feasible, control loblolly pine, sweetgum, and red maple saplings where established by removing their tops or cutting down the entire tree.

Monitoring Elements

Conduct appropriate monitoring and survey programs as funding and staffing permits to measure our success with respect to our objectives. The results may trigger adjustments to management strategies, or a reevaluation or a refinement of our objectives. Examples of monitoring or surveys that we may implement include:

- Prevent new invasive species from becoming established within the freshwater impoundments by utilizing Early Detection Rapid Response Techniques that detect newly established invasive species and immediately addresses those populations through the appropriate control measure. This will incorporate a combination of plant identification and inventories, maintaining updates of new invasive species present in the region, as well as having knowledge of the appropriate management techniques prior to conducting control efforts.

- To evaluate achievement of the objective for breeding and migrating priority passerine species continue to conduct landbird surveys and migration counts.
- Monitor shrub-scrub communities for the presence of loblolly pine, sweetgum, and red maple saplings.

Objective 2c. Forest Communities (Non-riverine Wet Hardwood, Maritime Swamp Forest, Mixed Wooded Wetlands, Maritime Upland Forest, Upland Mixed Woodland and Nontidal Wetlands-Reforestation Unit)

Enhance, restore and preserve 25% of the existing 1,415 acres of forested communities (forested swamp, mid-successional lowland forest, 2 acre Atlantic white cedar restoration stand, and maritime shrubland/woodlands) using accepted silvicultural practices to thin forest canopy and promote mid-story development to maximize nesting and foraging habitat for migratory songbirds of high conservation concern (e.g., Wood thrush, Veery, Eastern wood-pewee, Field sparrow, Black-throated green warbler, and Prothonotary warbler) and other species of conservation concern. Where possible, close up the tree canopy by either planting former agricultural lands or old fields with locally native tree seedlings (e.g., Black and water tupelo, Bald cypress, Water and Willow oak, and Green ash), or by reforesting through natural succession (e.g., Loblolly pine, Red maple, Wax myrtle, and Sweetgum).

Rationale

Of the total 9,035 acres of Refuge, approximately 1,415 acres are forested. Refuge forest communities are composed of approximately 650 acres of forested swamp, 700 acres of mid-successional lowland forest, and 65 acres of maritime shrubland/woodlands. Following a FWS Biologists' and Foresters' review of all Refuge habitats in the late 1990's, it was recommended that the Refuge thin loblolly pine, sweetgum, and red maple in Refuge forests – particularly around Sandbridge Road, as well as the Green Hills area. Thinning would open up the forest canopy and allow sunlight to reach the forest floor, thereby increasing ground cover, oak germination and mast production. Consequently, a mid-story canopy and additional food resources would be provided that would benefit declining migratory songbird species and resident mammals.

One of the major roles that this Refuge can play in the surrounding Virginia Beach landscape is to provide as much contiguous, non-fragmented native forest habitats as possible. Forest habitats are rapidly disappearing from the surrounding landscape, as urban sprawl continues spreading towards the rural Back Bay watershed of southeastern Virginia Beach. Wildlife habitats and resident wildlife are lost each year, as local woodlands are razed and replaced with large houses on small lots. Providing additional extensive forest habitats in the Back Bay vicinity has become a new priority; since this will also provide a last significant reservoir habitat for declining migratory bird species (e.g., prothonotary warbler, ruby and golden-crowned kinglet) and other resident wildlife that prefer large, non-fragmented forest tracts.

Most refuge forested habitats are not yet mature, and are principally lowland/bottomland types. As a result, their timber values are not very high. However, logging of some areas should occur, in accordance with good forest management practices and recommendations presented below.

Regional biologists theorize that remnant maritime forest along the western side of A-Pool may have formerly been a longleaf pine-pond forest that was clear-cut and drained, and replaced by the existing tree species. Tree thinning of young maples, sweetgums, and loblolly pines, along with prescribed burning, was recommended for this maritime forest remnant.

Tree thinning is also needed to open up the canopy in forests to the north and south of Sandbridge Road. This thinning would encourage natural regeneration of hard mast species such as oak, ash, and tupelo, where the sun can reach the forest floor. A Biological Review Team, suggested the future condition of these forest habitats (north and south of Sandbridge Road) and similar stands, should be towards a more complex canopy structure that favors retention of larger hardwoods and removal of loblolly pine; together with increased forest understory (shrubs) structure and development of large enough canopy openings to encourage successful oak regeneration where oak seedlings now exist.

The barrier island portion of the Refuge, along the western side of A-Pool, includes a young remnant maritime forest. It includes such southern species as live oak and pond pine, together with the usual red maple, sweetgum and loblolly pine. Other lowland forests exist along the western side of Back Bay, in the Nanney Creek, Beggar's Bridge Creek, Muddy Creek and Hell Point Creek vicinities, and along the northern and southern sides of Sandbridge Road. They consist primarily of red maple, bald cypress, sweetgum, black gum/tupelo, white oak, laurel oak, southern magnolia and scattered loblolly pine. Waxmyrtle, high-bush blueberry, and groundsel shrubs are also scattered about the forest floor, together with several ferns, vines, canes and greenbriers. In several older growth locations, very large trees exist that should be protected and preserved. A separate oak, tupelo, green ash and cypress seedling planting effort should occur in thinned areas that lack such parent trees, to restore more desirable bottomland tree species. Volunteers could be encouraged to plant oak and other hardwood seedlings, after the thinning is completed. A higher water table should be maintained in the replanted sites, to support the native tupelos, ash and cypress trees; since they prefer wet soils.

Strategies:

Within 2 years of CCP approval:

- Use EPA-approved herbicides, if necessary, to thin undesirables. This would also support the growth of new tree plantings and related restoration efforts.

- Plant seedlings of mast-producing oaks, tupelos, gums and/or green ash in areas that have had the canopy opened up, and where sunlight to reach the forest floor. Volunteers could be utilized to plant oak and other hardwood seedlings, after the thinning is complete.

- Investigate the feasibility of establishing a tree-cutting and planting "Partners Restoration Project" with Virginia Ecological Services Office..

- Manage for higher water levels by eliminating or plugging man-made drainage ditches to support new trees that prefer a high water table, where adjacent property owners would not be negatively impacted.

- Conduct a fire management program capable of carrying out several prescribed burns each year with the primary purpose of increasing plant diversity in upland and wetland communities, reducing the dominance of phragmites, and reducing fuel loads. Focus efforts on the Green Hills area for fuel reduction and habitat improvement.

Within 3 years of CCP approval:

- Increase the presence of a shrubby, mid-story canopy to benefit migratory songbirds by opening up the upper tree canopy in areas where sunlight cannot

reach the forest floor. This will also support the growth of tree plantings, and related restoration efforts.

- Initiate strategies to provide an additional 30 acres of mixed tupelos/gums, bald cypress, wetland tolerant oaks and green ash in woodlands to the north and south of Sandbridge Road, east of Colchester Road, and with the "Green Hill's" area.

- In the 2-acre Atlantic White Cedar restoration area, remove 90% of competing loblolly pine, sweetgum, red maple trees, waxmyrtle, and groundsel shrubs by annually thinning up to 2 acres of this vegetation in summer. This will be accomplished with chain-saws and hand tools and focus on areas with denser canopies that cause ground shading.

Within 10 years of CCP approval:

- Reduce the number/density of loblolly pine, red maple, and sweetgum trees to approximately 35% of all trees in the Sandbridge Road forest vicinities. Conversely, we would increase the number of tupelos/gums, bald cypress, wetland tolerant oaks and green ash so that they collectively comprise 60% of the tree species in the Sandbridge Road forest vicinities.

Monitoring Elements

Conduct appropriate monitoring and survey programs as funding and staffing permits to measure our success with respect to our objectives. The results may trigger adjustments to management strategies, or a reevaluation or a refinement of our objectives. Examples of monitoring or surveys that we may implement include:

- Conduct periodic monitoring to determine whether cutting and herbicides applications are necessary to thin undesirable plant species.

- Prevent new invasive species from becoming established within the freshwater impoundments by utilizing Early Detection Rapid Response Techniques that detect newly established invasive species and immediately addresses those populations through the appropriate control measure. This will incorporate a combination of plant identification and inventories, maintaining updates of new invasive species present in the region, as well as having knowledge of the appropriate management techniques prior to conducting control efforts.

- To evaluate achievement of the objective for breeding and migrating priority passerine species continue to conduct landbird surveys and migration counts.

- Where native seedlings are planted, monitor survival/mortality rates to determine whether supplemental plantings are warranted.

- To evaluate the effectiveness of prescribed burning conduct post-burn surveys to measure the area, the intensity, and the success of the burn.

GOAL 3: **Manage beach and dune habitats to preserve and protect migratory birds in addition to other native wildlife and plant communities, including species of conservation concern.**

Objective 3a. Fragile Dune Communities (Maritime Dune Grasslands)

Manage and protect approximately 420 acres of fragile dune communities by maintaining and enforcing the year-round closure to the public. The closure insures that damage incurred by human foot traffic on these dune slopes is minimal to nonexistent, and these fragile ocean buffers remain in as good a

condition as possible. Stable dune communities are characterized by the presence of the following plant communities:

- Sea rocket (Cakile edentula) and American beachgrass (Ammophila breviligulata) along the wrack/debris lines at the toe of the dune slope;
- Bitter seabeach grass (Panicum amarum ssp. amarum)and sea oats (Uniola paniculata) along with a diverse assemblage of low-cover species [e.g., seaside goldenrod (Solidago sempervirens var. sempervirens), sea-beach evening primrose (Oenothera humifusa), and spurges (Chamaesyce bombensis and polygonifolia)] along the crest of primary dunes and gentle back slopes; and,
- Beach panic grass and beachgrass along smaller secondary dunes away from primary dunes and salt spray.

Rationale

The refuge's dune complex consists of a series of several dunes (primary, secondary, tertiary, etc.) that have consistently withstood severe hurricanes and protected the 880 acre, freshwater impoundment complex to the west, from ocean overwash. Major threats to dune communities include development and coastal erosion. Excessive walking and vehicle traffic in dunes results in the loss of stabilizing plants (i.e. American beachgrass and sea oats), which reduces dune stability, accelerates erosion, and increases the chance of breaching during storm events.

Rare plant species are known to exist in Refuge and False Cape State Park dune swales. Some people in the community suspect that Refuge impoundment construction of G, H and J Pools contributed to the loss of some swales. However, Refuge biological staff maintain that construction of G, H and J Pools actually resulted in the creation of additional dune swale habitats, and that many of the plant species that exist therein include some of these rare dune swale species. Research is needed to confirm that the existing three "dune pools" contain many of the same species, and possibly in greater numbers, than the original swales that may have been impacted by the three impoundments' construction. Comparisons between the vegetation of the natural existing dune swales within False Cape State Park can be compared with the plant species within G, H and J Pools to arrive at a satisfactory conclusion. Additional rationale for this objective can be found on page 2-17 (Alternative A, Objective 3a)

Strategies

- Prohibit public entry into dunes unless by Special Use Permit. Allow only compatible uses on the beach.
- Conduct regular law enforcement patrols for visitor and resource protection.
- Replace old "closed area" signs with new and improved signage.
- Minimize motor vehicle use, frequent trespass, heavy equipment activities, and use of military ordinance or other activities that would negatively impact the dunes as determined by the Refuge Manager.
- Repair dune breaches where they occur by placing sand-fencing and/or discarded Christmas trees in the breach. If necessary, use the Refuge front-end loader to replace lost and start the dune rebuilding process.

- Encourage the formation of ocean-front, primary dunes by limiting vehicle access to only Refuge permittees and Back Bay NWR and False Cape SP employees on official business.

- Continue to keep Refuge dune systems closed to the public to avoid related negative impacts (e.g., loss of stabilizing plants, accelerated erosion, vandalism or disturbance to sea turtle nursery area, etc.).

- Eradicate beach vitex where it becomes established using accepted invasive species control methods (e.g., herbicide application).

Within 3 years of CCP approval:

- Coordinate with False Cape State Park to monitor and assess the effects of natural dune succession and natural dune swale plant community changes at both Back Bay NWR and False Cape State Park.

Monitoring Elements

Conduct appropriate monitoring and survey programs as funding and staffing permits to measure our success with respect to our objectives. The results may trigger adjustments to management strategies, or a reevaluation or a refinement of our objectives. Examples of monitoring or surveys that we may implement include:

- Prevent new invasive species from becoming established within the dune communities by utilizing Early Detection Rapid Response Techniques that detect newly established invasive species and immediately addresses those populations through the appropriate control measure. This will incorporate a combination of plant identification and inventories, maintaining updates of new invasive species present in the region, as well as having knowledge of the appropriate management techniques prior to conducting control efforts.

- *Within 1 year of CCP approval,* establish vegetation line transects in G, H, and J Pools to document plant species composition and changes in plant communities over time.

- *Within 3 years of CCP approval,* work with False Cape State Park to monitor and assess natural dune succession and natural dune swale plant community changes over time. The refuge and False Cape State Park will conduct comparative surveys/transects of three, 3-5 acre False Cape State Park dune swales, and three similar sized patches of wet marsh in G, H, and J Pools. Survey results will be compared to determine plant species composition, relative densities, and frequency of occurrences in both systems.

- To determine the location and extent of dune breaches, assess post-storm damage immediately east of the 880-acre, ten impoundment complex within 24 hours of a significant storm event.

Objective 3b. Upper Beach and Overwash Flats: Loggerhead and Green Turtles

Protect, through seasonal closures and prohibiting vehicular access, 4.2 miles of high beach habitat (approximately 200 acres) for federally threatened loggerhead and Green sea turtles to prevent disturbance during nesting (success rates of >90%), and to ensure successful emergence and movement of young into the Ocean. Work with partners to evaluate and reassess sea turtle nest managment practices in light of the January 2009 revised loggerhead sea turtle recovery plan, and continue nest relocations or other management and protection of nesting areas to reduce nest loss from storm or high tide overwashes, predators

or, other causes. Continue to allow coastal processes of wind and wave action to shape upper beach and overwash flats habitats.

Rationale

Refuge purposes include managing habitats for the continued support of threatened and endangered species. On the refuge, current management includes the protection of 4.2 miles of high beach (approximately 200 acres) that provides nesting habitat for federally threatened loggerhead and green sea turtles and ensures successful emergence and movement of young into the ocean. It is important to ensure that the local population of nesting Loggerhead sea turtles continues to have access to the refuge's undisturbed beach areas. Disturbances to the sandy beach surfaces, such as increased tire ruts, pose obstacles to sea turtle hatchlings during their run to the ocean from local nests.

It is theorized that our nesting sea turtle population, which at the northern extent of its breeding range, may contribute significantly to the male gender of the Atlantic's Loggerhead sea turtle population. Sea turtle gender is determined by ground temperature (Forbes 1992), where warm temperatures (>29° C) produce more females and cooler temperatures (<29° C) produce more males.

Strategies:

Continue to:

- From June 1st through August 31st, patrol ocean front beaches by all-terrain vehicles (ATV) from the southern boundary of Dam Neck Naval Base, south through Sandbridge, the Refuge, and False Cape State Park to the North Carolina border for signs of nesting sea turtles and for stranded turtles and marine mammals. Photo-document, collect tissue samples and record various measurements of stranded sea turtles in cooperation wiht the Virginia Marine Science Museum Stranding Team.

- Relocate sea turtle nests from ocean-front beaches of the community of Sandbridge, the Refuge and False Cape SP anc conduct other appropriate nest protection and management activities as determined through re-evaluation of sea turtle nest management practices. Any sea turtle nest relocations would follow the most current Refuge protocol, developed in conjuction with Refuge partners.

- Monitor sea turtle nests day and night, when eggs are close (7 to 10 days) to hatching date. Immediately transport hatchlings to the beach from relocated nest sites.

In addition:

- Work with USFWS Ecological Services, VDGIF, and other partners to evaluate and reassess sea turtle nest management on the Refuge and develop and implement any revised nest management practices that are appropriate and consistent with loggerhead sea turtle and green sea turtle recovery plans.

- Transport sea turtle hatchlings to the beach from relocated nest sites.

- Prohibit public entry into dunes unless by Special Use Permit.

- Continue prohibition on permittee use of the Refuge beach from 11pm – 5am during sea turtle nesting season to limit human disturbance

- Continue to prohibit vehicular access and other strictly recreational activities (e.g., swimming, surfing, sunbathing, picnicking, etc.).
- Ensure that the local sea turtle population has access to available nesting habitat along the 4.2 miles of Refuge high beach.
- Eradicate beach vitex where it becomes established using accepted invasive species control methods (e.g., herbicide application).

Monitoring Elements

Conduct appropriate monitoring and survey programs as funding and staffing permits to measure our success with respect to our objectives. The results may trigger adjustments to management strategies, or a reevaluation or a refinement of our objectives. Examples of monitoring or surveys that we may implement include:

- Prevent new invasive species from becoming established within the dune communities by utilizing Early Detection Rapid Response Techniques that detect newly established invasive species and immediately addresses those populations through the appropriate control measure. This will incorporate a combination of plant identification and inventories, maintaining updates of new invasive species present in the region, as well as having knowledge of the appropriate management techniques prior to conducting control efforts.
- Conduct daily sea turtle patrols to locate sea turtle crawls, nests and strandings at sunrise from late May through late August. Patrol areas, in the summer, using All-Terrain Vehicles (ATV) from the southern boundary of Dam Neck Naval Base, south through Sandbridge, the Refuge, and FCSP to the North Carolina border for sings of nesting sea turtles and for stranded turtles and marine mammals.
- Monitor sea turtle nests when eggs are close to hatching (7-10 days from expected hatch date) to evaluate hatch success and to support appropriate management of nest sites during hatching.
- Regue biological staff willphoto-document, collect tissue samples and record various measurements of stranded sea turtles; in keeping with Virginia Aquarium protocols. Data is forwarded to the Aquarium Stranding Center for inclusion in their annual Stranding Report.

Objective 3c. Upper Beach and Overwash Flats: Shorebirds and other species of high conservation concern

Continue to allow coastal processes of wind and wave action to shape approximately 200 acres of the upper beach and overwash flats community that benefit migrating shorebirds (e.g. Piping plover, Red knot, American oystercatcher, Whimbrel, Sanderling, and Semipalmated plover), tiger beetle species, seabeach amaranth, and other species of high conservation concern.

Rationale

Refuge beaches provide roosting and foraging areas for shorebirds during their spring and fall migrations. Increased vehicle traffic along Refuge beaches would reduce feeding activity and physically harass the large numbers of migrating shorebirds that use the refuge and False Cape State Park beaches during April-early June and August-September. Physical harassment resulting increased flight activity has been shown to negatively impact the condition and well-being

of migrating birds by increasing caloric expenditures, thereby reducing the amount of stored body fat required to survive their seasonal migrations. Reduced body fat may result in increased mortality rates during the arduous migrations that migratory birds undertake twice a year.

In addition, the North Mile high beach contains the best potential nesting habitat on Back Bay NWR for federally threatened piping plovers. While nesting occurrences for piping plovers have not been documented, suitable habitat does exist within the North Mile Beach. The refuge will use seasonal beach closures to limit disturbance to potentially nesting shorebirds.

Strategies

Continue to:

- Limit disturbance from vehicular and human traffic through seasonal beach closures.
- Maintain year-round closure of North Mile Beach to the public, in order to provide: potential nesting habitat for piping plovers, undisturbed roosting foraging habitats for shorebirds and waterbirds during their spring (late-April – end of May) and fall (mid-August – late September) migrations, and a buffer from the Little Island City Park public beach.
- Continue to phase out Refuge MVA use to minimize associated negative impacts to ocean-front beaches and related shorebird use during the spring and fall migration.
- Eradicate beach vitex where it becomes established using accepted invasive species control methods (e.g., herbicide application).

Monitoring Elements

- Prevent new invasive species from becoming established within the dune communities by utilizing Early Detection Rapid Response Techniques that detect newly established invasive species and immediately addresses those populations through the appropriate control measure. This will incorporate a combination of plant identification and inventories, maintaining updates of new invasive species present in the region, as well as having knowledge of the appropriate management techniques prior to conducting control efforts.
- When two or more piping plover sightings occur within the same area during routine shorebird beach surveys, conduct surveys to detect presence of nesting piping plovers during the breeding season.
- Monitor shorebird use throughout the year to detect species and beach use. Collect and share survey data with partners and interested agencies.

GOAL 4. **Provide natural environment for native fish, wildlife, and plant populations (with special consideration to those species whose survival is in jeopardy).**

Objective 4a. Threatened and Endangered Species

Continue current management practices (protection, monitoring, nest protection, ensuring high hatch and release rates, and habitat closures) of Federal and State threatened or endangered species, including the loggerhead sea turtle, piping plover, bald eagle, and eastern glass lizard.

Rationale for Objective

In keeping with the Endangered Species Act, Federal recovery plans for the above species, and Back Bay Refuge purposes and goals, the Refuge is responsible for ensuring that existing populations of endangered, threatened and rare species (whether Federal or State) are protected, and their populations encouraged to increase. The above practices have caused very high production rates (usually >90%) in sea turtle nests, and increased use of Back Bay by nesting bald eagles during the past 15 years. Refuge biological staff work with State non-game biologists to determine the extent of the Refuge glass lizard population.

Refuge habitats are used by several Federal and/or State-listed threatened or endangered species. These include: the State threatened Eastern slender glass lizard, State endangered Eastern big-eared bat, State threatened bald eagle, Federally threatened loggerhead sea turtle, and the Federally threatened piping plover. The bald eagle was de-listed in June 2007; however, protective actions are still required under other laws and regulations in order to maintain current population levels and prevent another decline. In addition, several State rare species are found throughout the Refuge, including the king rail, least bittern and the plant Liliaeopsis carolinensis. We would continue current management of the Refuge in order to protect and conserve these species. In addition, we specifically plan to maintain a nest success rate of 90% or higher for all Refuge sea turtle nests on Sandbridge, Refuge and False Cape State Park ocean-front beaches. Refuge biological staff have carefully studied differences between relocated sea turtle nests, and those left in place ('in situ') during 2003-2005. In addition, Refuge biologists have developed an extensive and detailed protocol for nest relocations during the past 15 years. Using Refuge protocols, nearly all viable, relocated turtle nests have experienced much higher hatching and emergence rates than those left "in situ."

Strategies

Continue to:

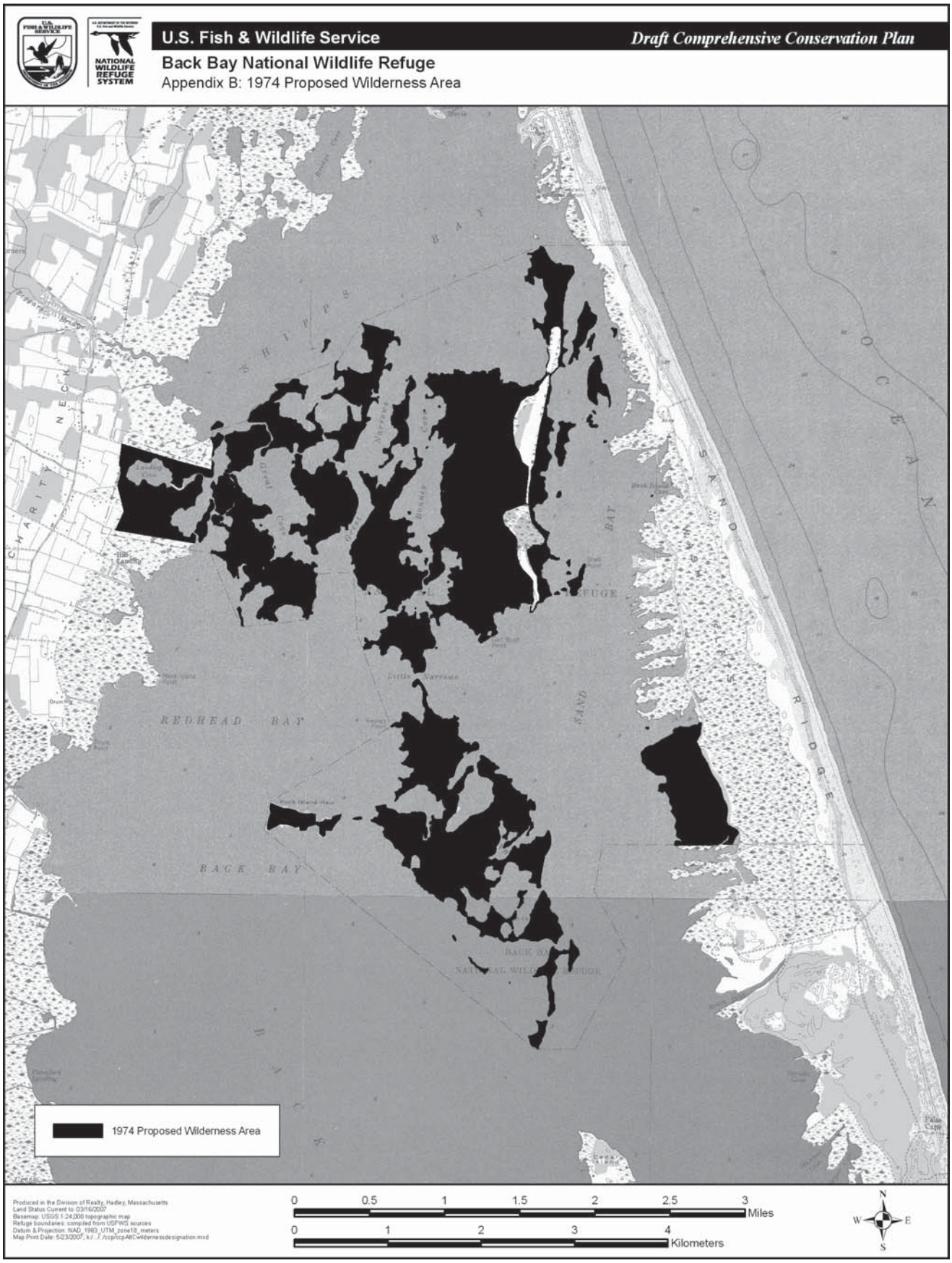
- From June 1st through August 31st, patrol ocean front beaches by all-terrain vehicles (ATV) from the southern boundary of Dam Neck Naval Base, south through Sandbridge, the Refuge, and False Cape State Park to the North Carolina border for signs of nesting sea turtles and for stranded turtles and marine mammals. Photo-document, collect tissue samples and record various measurements of stranded sea turtles in cooperation with the Virginia Marine Science Museum Stranding Team.

- Relocate all sea turtle nests from ocean-front beaches of the community of Sandbridge, the Refuge and False Cape SP. Sea turtle nests would be relocated, using the most current Refuge protocol, to one sea turtle nursery behind the primary sand dune and immediately west of the high beach, on the Refuge.

- Monitor sea turtle nests day and night, when eggs are close (7 to 10 days) to hatching date. Immediately transport the hatchlings to the beach from relocated nest sites.

- Conduct periodic surveys (approximately once every 3 years) for the glass lizard in cooperation with the State Nongame/Endangered Species Biologist to determine presence or absence.

- Twice a year, monitor the active bald eagle nest in the North Bay marshes vicinity and any new ones located on the Refuge and protect area around nests from disturbance. Monitoring shall provide a reliable productivity estimate.


U.S. Fish & Wildlife Service
Draft Comprehensive Conservation Plan
Back Bay National Wildlife Refuge
Appendix B: 1974 Proposed Wilderness Area
NATIONAL WILDLIFE REFUGE SYSTEM
CHARITY NECK
BACK BAY
REDHEAD BAY
SAND BAY
OCEAN
1974 Proposed Wilderness Area
Produced in the Division of Realty, Hadley, Massachusetts
Land Status Current to: 03/16/2007
Basemap: USGS 1:24,000 topographic map
Refuge boundaries: compiled from USFWS sources
Datum & Projection: NAD_1983_UTM_zone18_meters
0 0.5 1 1.5 2 2.5 3 Miles
0 1 2 3 4 Kilometers
N
W
E
S

Objective 4b. Wilderness

Rescind existing proposal to designate proposed Refuge Wilderness Survey Area (2,165 acres) as Wilderness (Map 4-1).

Rationale for Objective

The conditions within and surrounding the Refuge's WSAs have changed considerably since their original designation proposal in 1974. The population of Virginia Beach has increased by more than 250% since 1970, from 172,000 then to approximately 440,000 today. The proliferation of boats and personal motorized watercraft (i.e. jet skis) on waters surrounding the marsh islands has resulted in negative impact related to "sights and sounds" as compared to 30-plus years ago.

Non-native invasive plants within the WSAs, such as common reed (Phragmites species), are also more dominant and require intensive management to maintain biological integrity and environmental health. In addition, due to island erosion and the intensive management efforts needed to control encroachment of invasive species, the island assemblage is affected by man's work rather than the forces of nature. This work is noticeable throughout the year. Furthermore, although the island assemblage can provide limited opportunities for primitive recreation, and even solitude in the winter months, there are no *outstanding* opportunities for such throughout the year. The Green Hills and Landing Cove WSA units provide limited opportunity for primitive recreation opportunities, and do not meet wilderness size criteria.

Although the area no longer meets the minimum criteria for wilderness designation, the Service recognizes the importance of preserving plant and animal communities in a natural state for research purposes. Thus, the Service will identify, classify and establish the previously proposed areas as a Research Natural Area (RNA). Activities would be limited to research, study, observation, monitoring and educational activities that are non-destructive, non-manipulative, and maintain unmodified conditions as outlined in Service policy for RNAs. Service RNA policy also states:

- RNAs must be reasonably protected from any influence that could alter or disrupt the characteristic phenomena for which the area was established.
- The refuge manager may initiate management practices only where necessary to preserve vegetation and only as stated in a plan approved by the regional director. These management practices may include grazing, control of excessive animal populations, prescribed burning, and the use of chemicals for plant, insect and disease control.

Strategies:

- Maintain and manage all 2,165 acres of proposed wilderness that was designated under the 1974 EIS using "minimum tool." The minimum tool concept is defined in the glossary.
- Management would include continued invasive plant control, periodic bird surveys, and the annual October deer hunt program.

Within 2 years of CCP approval:

- Work with interest groups, partners (i.e., The Wilderness Society, Virginia Department of Game and Inland Fisheries) and appropriate government officials to rescind the proposal to designate the proposed WSAs as Wilderness.

- Initiate the formal process to remove all proposed WSAs from consideration as Wilderness. Complete procedures to designate appropriate areas as Research Natural Areas (RNA). Document in an approved Natural Area Information Form, and submit to Regional and Washington offices sequentially for approval.

Objective 4c. Cooperative Farming

Within 5 years of CCP approval, implement strategies for managing the existing farmland to benefit migratory birds during the fall migration and possibly winter.

Rationale for Objective
Cooperative farming has been permitted to occur on newly acquired lands that were farmed prior to acquisition since the early 1990s. Farming supports the local economy while maintaining the disturbed status of the land, in the event that a better use for it is determined. Agricultural farming is prevalent in the surrounding community. Only corn and soybeans are grown on these lands (since they also provide a wildlife food value), and only approved pesticides and herbicides are permitted. Genetically modified crops are not permitted.

However, possible conflicts with the Service's Biological Integrity policy may force terminating the Cooperative Farming Program. The policy specifies that farming on refuges must provide direct, primary wildlife benefits to specific wildlife populations for which the refuge was established. Secondary benefits alone do not constitute justification for continuation of farming on a national wildlife refuge.

Strategies:

Continue to:

- Allow farmers to provide direct payment for participating in the cooperative farming program.

- Allow farmers to use pesticides only after pesticide use proposals are approved by the Regional Office.

Within 2 years of CCP approval:

- Explore the possibility of the farmers contributing a portion of their crop to migratory birds in the fall, in lieu of rental payments. If it is determined that this would provide a more beneficial habitat for migratory birds than native vegetation, this contribution could take the form of several acres of grain being knocked down or otherwise being used to benefit migratory birds.

To provide time for adequate planning and evaluation, within 5 years of CCP approval:

- Phase out cooperative farming as a Refuge program, in keeping with the Service's Biological Integrity policy.

- The Refuge will develop a phase-out plan including strategies to reforest/ restore the parcels to wildlife habitats with native tree and shrub species.

- Notify farmers of the timeline, and request existing farmers to voluntarily withdraw within the timeline.

- Where restoration plans can be implemented, and farmers have not voluntarily withdrawn, no new cooperative farming agreements will be issued.

Within 10 years of CCP approval:

- Convert former agricultural areas to forest and/or shrub-scrub habitats.

Objective 4d. Submerged Aquatic Vegetation Management

Restoration work pertaining to SAV can be found under Objective 1e.

Within five years of approval of this CCP, we will increase (to four) the number of multi-agency partnerships aimed at providing additional reliable water quality, vegetation, wildlife use, and habitat management data, together with other environmental conditions of Back Bay.

Rationale for Objective

Refuge staff do not often possess the necessary skills and time to conduct landscape level work outside the Refuge. State, City, private and other Federal agencies exist that do, together with local citizens. Because of mutual interests in the same natural resources, new partnerships need to be forged, that provide mutual benefits to all partners, pool funding, and shortstop potential problems before they become problems. These partnerships should also present possible solutions to current and future habitat degradation issues that affect us all. Such important field data and information may help prevent future isolations of wildlife populations, and their gene pools, in addition to providing evidence that habitat restoration efforts are in fact working (i.e., targeted migratory bird species are now using these newly restored areas). The Refuge alone cannot hope to accomplish the necessary major improvements, on the landscape and/or ecosystem level, that would truly make a difference to Refuge natural resources; however, specialized teams or partners can.

Wind tidal influences are present in the Back Bay Watershed and often pose a negative hydrological influence on existing plant and animal communities (such as SAV), and local agriculture. A lunar tide does not exist. Typically these wind tides flood adjacent wetland areas during the growing season when winds are predominantly from the south; and maintain low water levels during winter when winds are predominantly from the north. Normal surface water hydrology operates oppositely; with low levels during summer (that encourages germination and reproduction of native plant communities and related organisms) and high levels during winter (that buffers the substrate and organisms within from freezing and other cold weather impacts).

The areas of open-water/pothole habitats, that include Ragged Island and southern Long Island, are areas that had previously supported higher aquatic biodiversity up until 2001. Thus, they should have the highest potential for recovery to previous levels, if provided with the necessary protection and time to recover from past frequent disturbances to the water column. Such disturbances in the past have included frequent boat traffic, net-fishing, and recreational personal watercraft activities. A lack of disturbance to the water column should provide time for turbidity to settle out of the water column in these protected, sheltered coves and potholes, where wave action is reduced to a minimum. Decreased turbidity would permit sunlight to reach the substrate and encourage germination of the existing SAV seed-bank. That seed-bank should still be viable. Once SAV germination occurs, the biodiversity associated with it (i.e., fish, shellfish, invertebrates, amphibians, waterfowl, etc) should also return. The return of biodiversity below the water's surfaces of Back Bay hinges on the return of SAVs, and the elimination of as many negative impacts as possible that detract from that goal.

The US Army Corps of Engineers is the Federal agency responsible for maintenance and protection of the nation's waterways; therefore, the Refuge and FWS must partner with them in order to initiate and implement such changes.

Strategies:

Continue to:

- Cooperative efforts with partners in North Carolina through participation in the Service's Carolina Virginia Strategic Habitat Conservation Team and the rest of the Albemarle-Pamlico Estuarine System (APES). This effort would include mapping existing SAV beds throughout APES, compiling historical SAV distribution reference materials, and establishing restoration and improved SAV management guidelines.

- Actively work with the U.S. Army Corps of Engineers in the Currituck Sound Feasibility Study, particularly in respect to their Hydrodynamics/Water Quality Modeling Work Group and the Fisheries, Shellfish, Submerged Aquatic Vegetation and Waterfowl Work Group.

- Explore new partnerships (Virginia Institute of Marine Science) to help understand and improve SAV in Back Bay.

- Refer to Objective 1e. p. 4-8 for additional strategies.

In addition:

- Pending results of the North Carolina-FWS "SAV Study," determine the best SAV restoration technique(s); and implement those SAV restoration techniques on the best available Refuge sites in the Back Bay watershed.

- Create new habitat improvement partnerships where possible, and work with State, Federal, and university partners in new, as well as current, cooperative research programs aimed at improving Refuge and Back Bay habitats and wildlife resources.

- Work with partners (State, universities, interns, bird-watching groups, and/or volunteers) to study Refuge use by neotropical migrant birds, particularly in wetlands and forest restoration areas. (i.e., "*Are rare bird species appearing that prefer large forest tracts, and were not present previously?*")

- Ensure that Refuge wetlands and open-water/pothole habitats remain protected from public disturbances. These areas include Ragged Island and southern Long Island, which have historically supported the greatest waterbird use. Through working with the US Army Corps of Engineers (USACE), initiate personal watercraft use controls in the sensitive, high waterbird-use areas of Ragged and Long Islands. Establish the necessary cooperative regulations to ensure effective public use management during this transition, and develop enforcement capabilities involving possible partnerships with the Virginia Marine Resources Commission, US Coast Guard, Virginia Department of Game & Inland Fisheries, etc., to insure that violations of USACE policies and regulations are not ignored.

GOAL 5.

- Eliminate the Back Bay wind tide influences in restoration sites within the upper reaches of the Back Bay watershed, by installing ditch-plugs or water control structures in connecting, man-made ditches.

Provide additional viewing opportunities of migratory birds and other wildlife to

increase the general public's appreciation and support of natural resources.

The National Wildlife Refuge System Improvement Act of 1997 recognizes wildlife photography and observation, environmental education and interpretation, and hunting and fishing as the six priority public uses of the Refuge System. This means that when considering goals and objectives, priority public uses receive enhanced consideration over non-priority uses. Refuges provide outstanding opportunities to observe and appreciate wildlife in its natural environment. Refuges also provide quality opportunities to engage in wildlife-dependent recreation and foster an appreciation for wildlife and habitat as a participant in the natural environment.

Objective 5a. Wildlife Observation and Photography

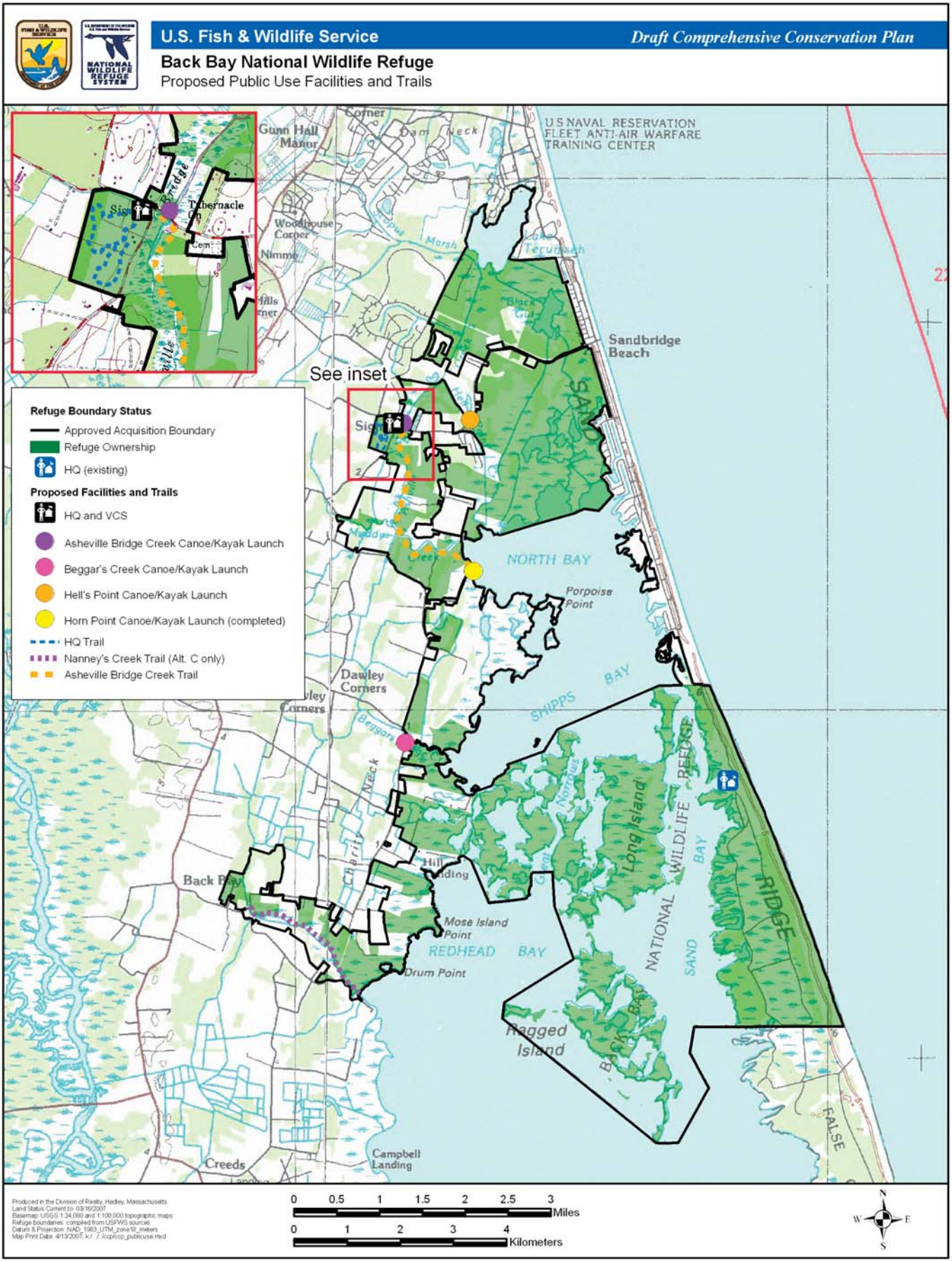
Within 5-7 years of CCP approval, ensure that wildlife observation and photography opportunities meet the needs of 90% of participants.

Rationale for objective
In order to enhance opportunities for wildlife observation and photography, we must improve and expand public access facilities on the Refuge to meet the needs of 90% of the participants. Many of the strategies for wildlife observation and photography are also applicable to the other priority public uses such as environmental education and interpretation. Enhancing these opportunities can increase visitation, thereby expanding public support and understanding of Back Bay NWR and the Refuge System.

This action would expand viewing and photography opportunities on the Refuge beyond what is currently occurring. We will develop a canoe/kayak trail between four launch sites on Asheville Bridge Creek, Hell's Point Creek, Beggars Bridge Creek (Lovitt's Landing), and Horn Point. As discussed in Alternative A of the draft CCP, we currently have a launch site at Horn Point. Under this action, we will develop the other three access points. At all sites, we will develop a low-impact canoe/kayak launch ramp, an 8 to 12 car parking lot, and a restroom. Under this management action, we will also implement a fee collection program at Horn Point for all commercial canoe/kayak launching. Commercial operators could purchase various passes, depending on the number of trips per season, as follows: $20 per trip, up to 4 trips; $100 per season for 5 to 10 trips; $200 for 11 to 20 trips; and, $300 for 21 or more trips. Outfitters must schedule trips in advance.

We will develop a 2-mile hiking trail beginning at the proposed HQ/VCS site (Tract 244 on Sandbridge Road) and ending at Horn Point. Two footbridges will be constructed along the trail: one going over Asheville Bridge Creek at the ABCEEC, and another going over Muddy Creek. Interpretative signs would be placed strategically throughout the trail. The development of the trail will be completed in different phases. We will first work to develop each site (i.e. Asheville Bridge Creek and Horn Point), and then work on constructing the footbridges and connecting the trail with boardwalk. We plan to fully complete the trail, with footbridges, boardwalk, and signs within 15 years of this plans approval (Map 4-2).

Bicycling and hiking on the Refuge has increased in recent years, likely due to local development and increased awareness of the public opportunities at FCSP (access through the Refuge by hiking or biking only). In order to provide a safe and quality experience for all Refuge users, we will relocate and construct a new fee booth, to be aligned with Sandpiper Road. Once the entrance is moved, we will develop a new maximum 20-car parking lot to accommodate parking for hikers and bikers. The existing entrance road will be restriped to accommodate vehicles, bicycles, and pedestrians providing a safer route.


U.S. Fish & Wildlife Service
Draft Comprehensive Conservation Plan
Back Bay National Wildlife Refuge
Proposed Public Use Facilities and Trails
See inset
Refuge Boundary Status
Approved Acquisition Boundary
Refuge Ownership
HQ (existing)
Proposed Facilities and Trails
HQ and VCS
Asheville Bridge Creek Canoe/Kayak Launch
Beggar's Creek Canoe/Kayak Launch
Hell's Point Canoe/Kayak Launch
Horn Point Canoe/Kayak Launch (completed)
HQ Trail
Nanney's Creek Trail (Alt. C only)
Asheville Bridge Creek Trail
U.S. NAVAL RESERVATION
FLEET ANTI-AIR WARFARE
TRAINING CENTER
Sandbridge Beach
NORTH BAY
Porpoise Point
SHIPPS BAY
Dawley Corners
Back Bay
Mose Island Point
REDHEAD BAY
Drum Point
Hagged Island
NATIONAL WILDLIFE REFUGE
Long Island
RIDGE
SAND
FALSE
Creeds
Campbell Landing
Gunn Hall Manor
Woodhouse Corner
Nimmo
Tabernacle
Produced in the Division of Realty, Hadley, Massachusetts
Land Status Current to: 03/16/2007
Basemap: USGS 1:24,000 and 1:100,000 topographic maps
Refuge boundaries: compiled from USFWS sources
Datum & Projection: NAD_1983_UTM_zone18_meters
Map Print Date: 4/13/2007, k:/.../ccp/ccp_publicuse.mxd
0 0.5 1 1.5 2 2.5 3 Miles
0 1 2 3 4 Kilometers
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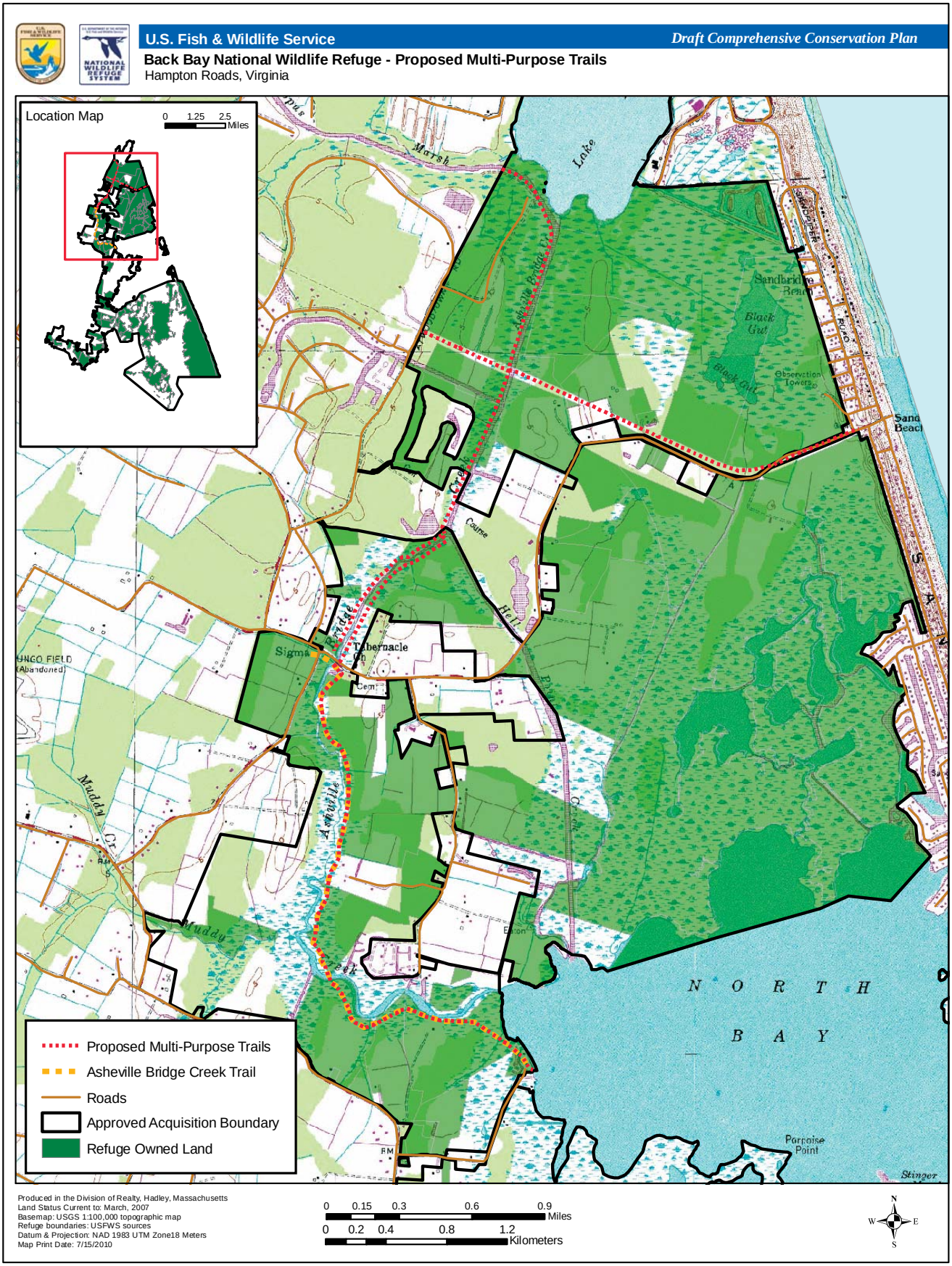

U.S. Fish & Wildlife Service
Draft Comprehensive Conservation Plan
Back Bay National Wildlife Refuge - Proposed Multi-Purpose Trails
Hampton Roads, Virginia
Location Map
0 1.25 2.5 Miles
Proposed Multi-Purpose Trails
Asheville Bridge Creek Trail
Roads
Approved Acquisition Boundary
Refuge Owned Land
N O R T H
B A Y
Tabernacle
Sandbridge Beach
Black Gut
Observation Tower
Porpoise Point
Stinger
Produced in the Division of Realty, Hadley, Massachusetts
Land Status Current to: March, 2007
Basemap: USGS 1:100,000 topographic map
Refuge boundaries: USFWS sources
Datum & Projection: NAD 1983 UTM Zone18 Meters
Map Print Date: 7/15/2010
0 0.15 0.3 0.6 0.9 Miles
0 0.2 0.4 0.8 1.2 Kilometers
N
W E
S

Strategies:

Continue to:

- Complete the construction of the canoe/kayak launching facility at Horn Point.
- Utilize existing trams and programs. Currently, tram tours are conducted in cooperation with Back Bay Restoration Foundation (BBRF).
- Maintain the VCS, the ABCEEC, entrance booth, 50-car parking lot, other structures and buildings, interpretive and directional signs, informational kiosks, benches, trams, vehicles, and trails.
- Develop additional public access facilities. The Refuge is part of the new Virginia Coastal Birding Trail and is a viewing location along the multi-refuge Charles Kuralt Trail.
- Provide opportunities for photography and wildlife observation at the wildlife observation building (northeastern portion of C pool).

Within 1 year of CCP approval:

- Implement fee collection program at Horn Point for commercial canoe/kayak launching.

Within 5-7 years of CCP approval:

- Develop canoe/kayak trail between Asheville Bridge Creek, Hell's Point Creek, Beggars Bridge Creek (Lovitt's Landing), and Horn Point.
- Construct kiosks in conjunction with newly proposed trail heads and canoe/kayak launch sites.
- Construct handicap accessible trail on Tract #244, in conjunction with new HQ/VCS, after remaining land is reforested.
- Provide 8 to 12 car parking lot, a low impact canoe/kayak launch ramp and a restroom at Asheville Bridge Creek, Hell's Point Creek, and Beggars Creek sites throughout the canoe/kayaking and hiking trails
- Utilize trams for transportation to wildlife viewing facility.
- Move and construct new fee booth and restripe existing road to accommodate bicyclists and pedestrians.
- Develop a new 20-car parking lot behind the new fee booth (south of the hammerhead) for hikers/bikers.

Objective 5b. Environmental Education and Interpretation

Within 5-7 years of CCP approval, improve environmental education and interpretation opportunities on the Refuge such that 90% of participants would be able to identify one purpose of the Refuge and one species we manage on the Refuge.

Rationale for Objective

Similar to wildlife observation and photography, environmental education and interpretation programs can dramatically increase public awareness for the Refuge System because these activities can be scheduled with a syllabus to reach target audiences such as, school groups, conservation organizations, community groups, etc. In addition, interpretive panels and displays can help communicate the agency mission to all Refuge visitors.

Under this management action, we will expand the number of fishing events that we have each year. We will have a total of two fishing education events per year. The second event, to be hosted in the spring, would be coordinated and co-hosted with VDGIF. This event will be more like a workshop, with a registration fee, and include education on aquatic ecology, fish biology, angling techniques and non-native species. Also, the event would allow attendees to fish and compete for prizes (i.e. fishing derby). In addition, we will initiate a youth hunt for white-tail deer and feral hogs (See Objective 6a) and additional waterfowl hunting on the Refuge (See Objective 6b).

The construction of the new wildlife viewing facility (refer to rationale under objective 5a) would also provide opportunities for environmental education and interpretation. We will maintain four interpretative signs along the proposed hiking trail (refer to rationale under objective 5a) that would provide education and interpretation along this self-guided trail.

We will develop of a new facility to include refuge headquarters, VCS, and an Environmental Education Center (EEC)(Map 2-3). Construction would follow Regional design standards for a medium facility (see Goal 7 for additional details of the facility). Once this new facility is built it would become the primary environmental education facility. The ABCEEC would become an office and maintenance facility. Many of the strategies for wildlife observation and photography are also applicable to the other priority public uses of environmental education and interpretation, and vice versa.

Strategies:

Continue to:

- Provide on- and off-site, as well as web site environmental education programs for area schoolchildren.

- Provide exhibits in the Visitor Contact Station (VCS) to communicate the history of the Refuge, cultural influences in the area (fishing & watermen, hunt clubs, decoy carving, etc.) and natural resource themes.

- Keep Asheville Bridge Creek Environmental Education Center (ABCEEC) available for use by schools and groups. The facility also houses the Refuge's museum collection, and provides office space for the Refuge's support group, the Back Bay Restoration Foundation (BBRF).

- Provide natural history interpretation in the VCS, through self-guided interpretive displays along trails, audiovisual programs, Service and Refuge-specific publications, guided walks, talks and field demonstrations, and through guided tram tours and special events.

- Maintain the Refuge's Bay Trail, adjacent to the headquarters, which includes a pond activity pier, outdoor classroom site, and interpretive kiosks.

- Provide opportunities for environmental education and interpretation at the wildlife observation building (northeastern portion of C pool).
- Work independently and with partners to provide teacher workshops.

Within 1 year of CCP approval:

- Expand fishing education events at the Refuge to 2 events per year.

Within 5-7 years of CCP approval:

- Develop four interpretive signs that would be placed strategically throughout the hiking trail from the proposed headquarter site to Horn Point.
- Increase on- and off-site environmental education programs and teachers workshops by 20%.

Within 7-10 years of CCP approval:

- Develop and design a new headquarters, VCS, and EEC.
- Once the new headquarters facility is built, use the ABCEEC building as an office and facility for maintenance.

Objective 5c. Non-wildlife dependent uses

Within 5-7 years of CCP approval, improve the quality of non-wildlife dependent recreation facilities to meet the needs of 90% of participants.

Rationale of objective
We will prohibit dog-walking on the Refuge. Since the Refuge mission consists of providing habitats for wintering and migrating birds that include waterfowl, shorebirds, wading birds, marshbirds and landbirds, minimizing those uses that provide the greatest potential conflicts and disturbances to those migratory bird species is a priority. Dogs have been shown by recent research to displace native migratory bird species from the natural habitats that Back Bay NWR was established to provide.

Under this alternative, the Refuge will also work with City and State partners for scenic byway opportunities. This will include a biking trail head once our new headquarter and VCS facility is completed. This will allow the existing biking community a place to connect to the Refuge for enhanced understanding and appreciation of the adjacent, road-side habitats they observe on existing bike routes.

Strategies:

Canoeing and Kayaking

Continue to:
- Provide a car top canoe/kayak launch site at the Refuge headquarter area and at the Horn Point Public Access Site.
- Work with the City of Virginia Beach to develop additional launch sites on Refuge property.

Hiking and Bicycling

Continue to:

- Allow hiking and bicycling along the Refuge dike roads during April through October and year-round along the Refuge beachfront (except the "North Mile"), the entrance road, and the headquarters trails.

Horseback Riding

Continue to:

- Prohibit horseback riding on the Refuge. Horseback riding is not considered to be an appropriate public use (refer to Appendix A for the finding of appropriateness for horseback riding).

Dog Walking

Continue to:

- Annually permit leashed dogs on the Refuge, from October through March (excluding the annual hunt in October).

Within 1 year of CCP approval:

- Within 6 months of CCP approval, dog-walking will no longer be permitted in any Refuge locations. (refer to rationale of objective above)

GOAL 6. **Provide and expand hunting and fishing opportunities to the public where compatible with Refuge purposes.**

Objective 6a. Deer (and Feral Hog) Hunting

Within 3 years of CCP approval, expand high-quality deer hunting opportunities to meet the needs of 90% of participants.

Rationale for Objective

Under this management action, we will fully analyze the potential of expanding additional deer hunting in new areas through a complete and separate NEPA analysis. The refuge intends to begin this analysis within 3 years of CCP approval. We will work closely with VDGIF to pull together data necessary to complete this analysis. We propose to expand the areas in which deer hunting opportunities would be provided. In order to meet the needs of 90% of the participants, new opportunities would be provided in areas located in the North and West sides of the Refuge (see Strategies below). Deer management in those areas has become increasingly more important over the past couple years due to overbrowsing on Refuge habitats and local agriculture; however new hunting zones would be established in two phases in order to accomplish existing habitat management objectives. The hunt serves a dual purpose of providing public opportunity for hunting, while deer populations are reduced, a necessity for proper habitat management.

Implementing new hunt areas would be administered the same way as our existing hunt on the barrier spit, which includes a lottery system in cooperation with VDGIF. We have identified a hunter density of 1 pair of hunters per every 50 acres of suitable deer habitat within designated hunting zone. Some zones would be designated as bow hunting only. Each new zone would be open to selected hunters 3 to 5 consecutive days in each of October, November, and December, in accordance with VDGIF season dates. Hunters applying to hunt the new zones can select a preferred zone and month to hunt. Parking would be provided at selected sites throughout the new zones. Parking availability would be re-evaluated whenever new Refuge land is acquired. Maps and permits would be sent out to all selected hunters. Hunters would be responsible for carrying their permits at all times and would be required to report (call in) whether or not they hunted and any deer harvested. Signage would be posted along waterways

adjacent to hunt zones. Refuge law enforcement as well as state law enforcement would ensure that all hunters follow state and refuge regulations. No "drive-hunting" would be allowed in these areas – only still-hunting would be permitted. Dogs would not be allowed when hunting in these areas. In addition, no rifles or crossbows would be allowed.

Safety of residents, hunters, and other visitors is important. We would clearly post hunting areas and adjacent waterways to notify boaters and land-based visitors of potential hunting activity.

In addition to expanding hunting areas, we will coordinate with the State to initiate a youth hunt on the Refuge, as part of our increased environmental education initiative (Connecting Children with Nature) and expansion of priority public uses (see Objective 5.b). This would include hunting of both white-tailed deer and feral hogs. We will dedicate one of the current eights zones for the youth hunt on the opening Saturday of the season. Adult hunts will then begin the following Saturday. The zone would be determined and advertised for each new season. During our youth hunts, we will enforce the one gun rule. Only the child can carry a gun, not the adult that accompanies them.

We will conduct, under this action, periodic reevaluation of the hunting program. This evaluation will help us to determine if we are adequately meeting the management needs. Depending on the results of the evaluation, the hunt would be expanded, reduced or maintained to meet management needs. An evaluation of the hunt would take place once every 3 years.

We define a high-quality hunt program as one that:

- Maximizes safety for hunters and other visitors;
- Encourages the highest standards of ethical behavior in taking or attempting to take wildlife;
- Is available to a broad spectrum of hunting public;
- Contributes positively to or has no adverse effect on population management of resident or migratory species;
- Reflects positively on the individual Refuge, the System, and the Service;
- Provides hunters uncrowded conditions by minimizing conflicts and competition among hunters;
- Provides reasonable challenges and opportunities for taking targeted species under the described harvest objective established by the hunting program. It also minimizes the reliance on motor vehicles and technology designed to increase the advantage of the hunter over wildlife;
- Minimizes habitat impacts;
- Creates minimal conflict with other priority wildlife-dependent recreational uses or Refuge operations; and
- Incorporates a message of stewardship and conservation in hunting opportunities.

Strategies:

Continue to:

- Conduct a minimum seven-day white-tailed deer and feral hog hunt each year
- Evaluate hunter satisfaction, as well as harvest rates of deer and hogs, to make management changes as needed to meet the Refuge goals, vision and purpose.
- Partner with Virginia Department of Game and Inland Fisheries to administer the hunt via a computerized permitting system.

Within 3 years of plan's approval:

- Fully analyze the potential of adding waterfowl hunting through a complete and separate NEPA analysis. The refuge intends to begin this analysis within 3 years of CCP approval.
- Work with VDGIF to assist with implementing a waterfowl hunt at Redhead Bay. Blind stakes will be located at three sites (Map 4-4).
- Implement a limited waterfowl hunt at Colchester impoundment in partnership with VDGIF.
- Support VDGIF with waterfowl hunt at FCSP by providing parking at Refuge. Within 3 years of CCP approval (phase 1):
- Fully analyze the potential of expanding deer hunting (as described below) through a complete and separate NEPA analysis. Work with VDGIF to pull together data necessary to complete this analysis.
- Expand deer hunting opportunities in the Sandbridge area, north and south of Sandbridge Road on Tracts 101d, 102, 103, 104, 104a, 104b, 106, 108b, and 110 (Zones A, B, C, D). Parking would be provided at the old tower pad on Tract 107 (Zone A) and we would coordinate with the City of Virginia Beach for possible parking spots at the Sandbridge Fire Station (adjacent to Zone D) and along the utility right-of-way adjacent to Tract 106b (Zones B, C) (Map 4-5).
- Expand deer hunting opportunities (bow only) at the end of Bank Lane on Tract 127a (Zone G), and along Muddy Creek Road on Tracts 163, 166, and 169 (Zone I). Parking would be provided on federal property at the end of Banks Lane and on Tracts 163a and 166, respectively.
- Expand deer hunting along Muddy Creek Road at Pleasant Ridge Road on Tract 194 (Zone J), with parking on site.
- Implement a youth hunt on opening day in Zone 4 (refer back to Map 4-5).
- Evaluate the feral hog and deer hunt to determine if they are meeting management needs.

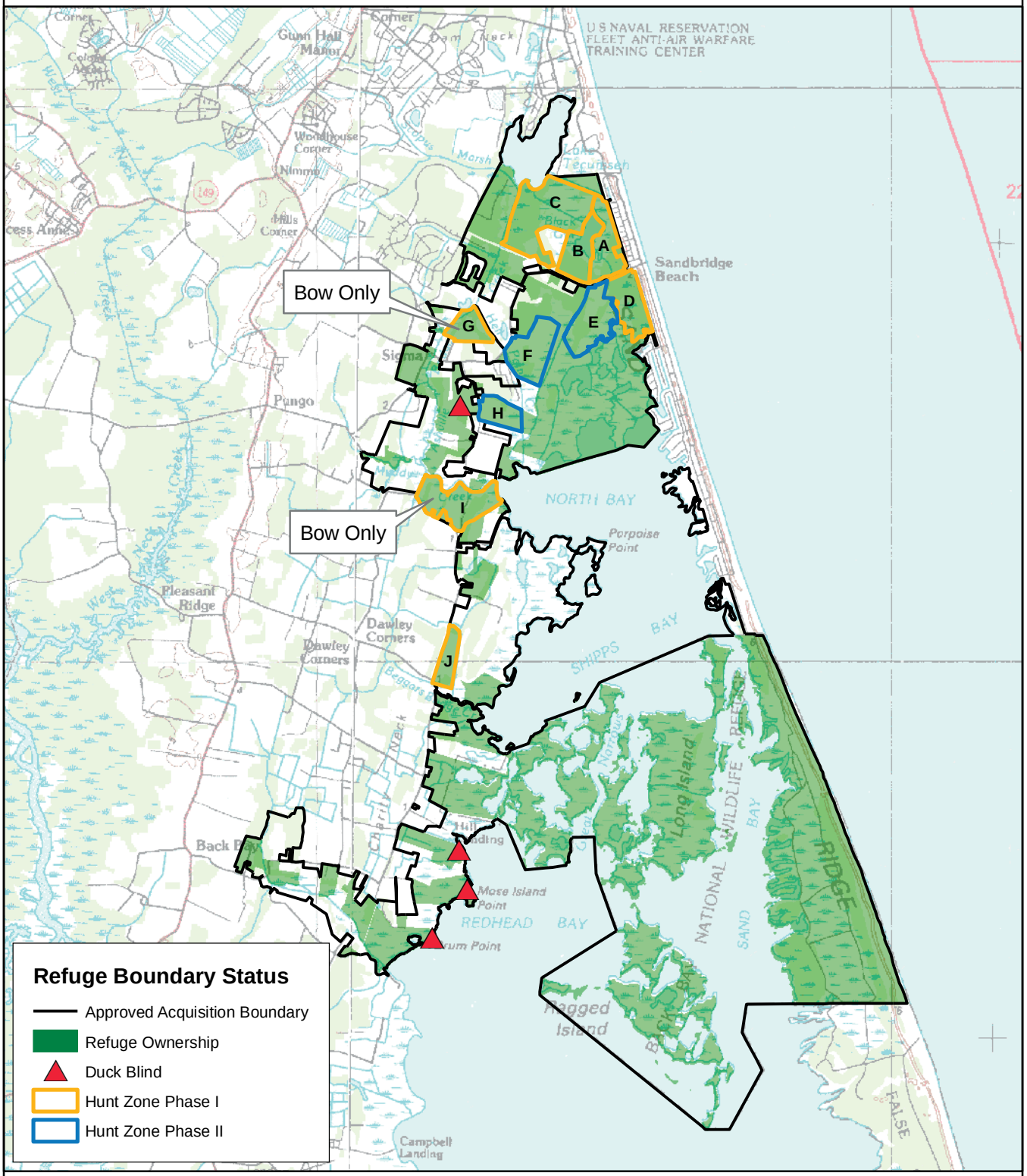
Within 10 years of CCP approval (phase 2):

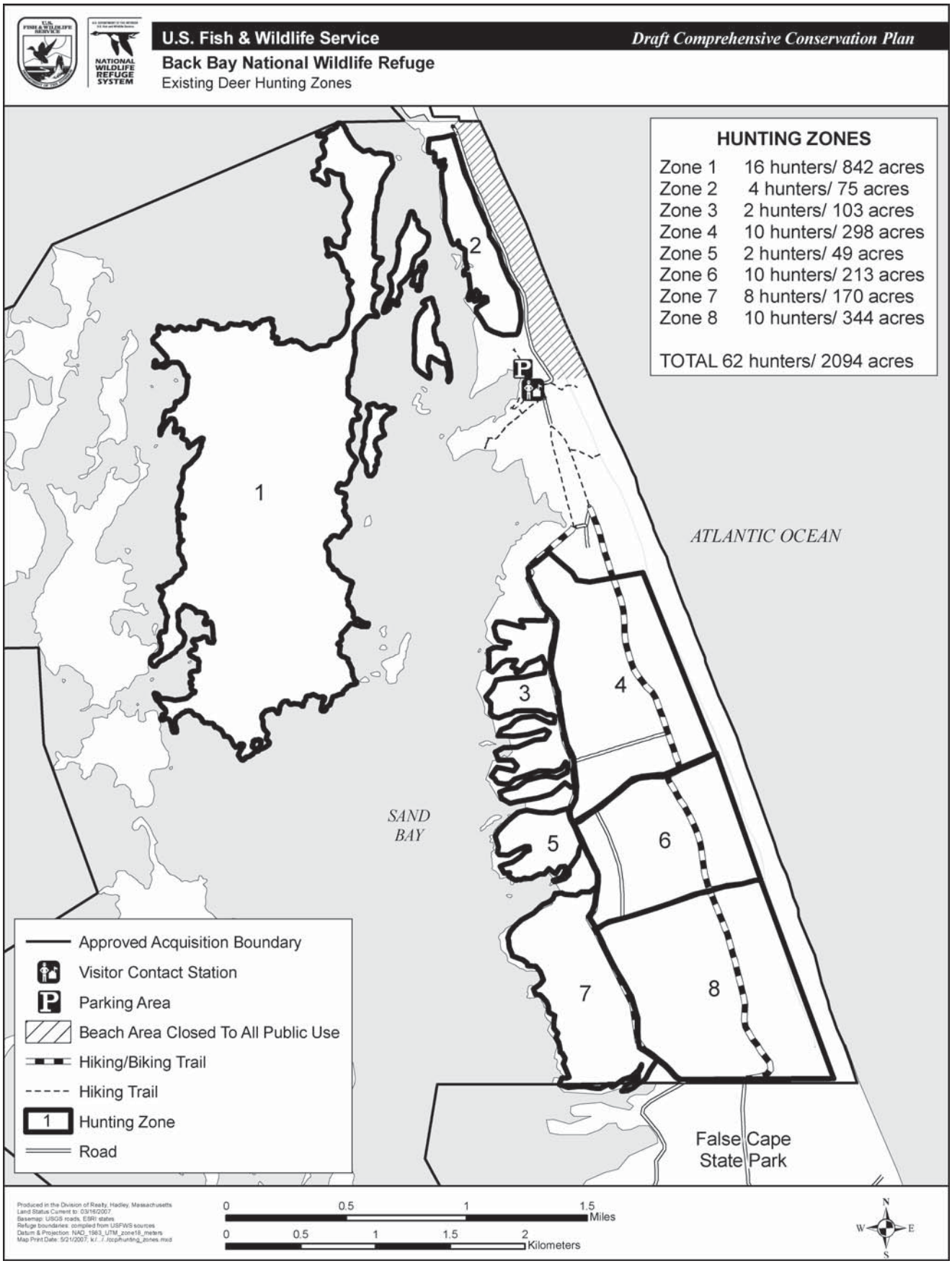
- Expand deer hunting opportunities south of Sandbridge Road at the "old hunt club" on Tract 104b (Zone E). This portion of Tract 104b has an existing road and parking area on site.

U.S. Fish & Wildlife Service *Draft Comprehensive Conservation Plan*

Back Bay National Wildlife Refuge

Alternative B: Proposed Deer and Waterfowl Hunting Expansion




U.S. Fish & Wildlife Service
Draft Comprehensive Conservation Plan
Back Bay National Wildlife Refuge
Existing Deer Hunting Zones
HUNTING ZONES
Zone 1 16 hunters/ 842 acres
Zone 2 4 hunters/ 75 acres
Zone 3 2 hunters/ 103 acres
Zone 4 10 hunters/ 298 acres
Zone 5 2 hunters/ 49 acres
Zone 6 10 hunters/ 213 acres
Zone 7 8 hunters/ 170 acres
Zone 8 10 hunters/ 344 acres
TOTAL 62 hunters/ 2094 acres
ATLANTIC OCEAN
SAND BAY
False Cape State Park
Approved Acquisition Boundary
Visitor Contact Station
Parking Area
Beach Area Closed To All Public Use
Hiking/Biking Trail
Hiking Trail
Hunting Zone
Road
Miles
Kilometers
N
W
E
S

- Expand deer hunting opportunities east of Sandbridge Road at the "reforestation site" on Tract 125a (Zone F). This area has an existing road and parking area on site.

- Expand deer hunting opportunities east of Colchester Road on Tract 150 (Zone H). This area has an existing road and parking area on site (Map 4-4).

Objective 6b. Waterfowl Hunting

Within 3 years of CCP approval, provide a high-quality waterfowl hunt program in partnership with the VDGIF at Redhead Bay and Frank Carter impoundments on Colchester Road.

Rationale for Objective

As part of our increased environmental education initiative and expansion of priority public uses (see Objective 5.b), we will conduct a waterfowl hunting program in two areas within the Refuge. This hunting program will be administered according to both State and Refuge regulations. One waterfowl hunting area is Redhead Bay, located south of the Presidential Proclamation area. We will provide three sites within this area for waterfowl hunting, located on Back Bay on Tracts 229, 217, and 214-I. These areas will be designated by three stakes that would accommodate temporary (i.e. float/boat) waterfowl hunting blinds. The VDGIF would assist with implementing the waterfowl hunt three days per week during the season. In order to ensure that hunters are not building additional blinds in the three staked areas, we will have a law enforcement official check each stake periodically.

The second waterfowl hunting area is the Frank Carter impoundments. An annual one-day limited youth waterfowl hunt will be implemented here in partnership with the VDGIF. Construction at this site will be minimal considering a small parking lot is already in place.

A partnership with VDGIF will provide benefit to both parties. In return for aiding us with our waterfowl program, we will provide support to VDGIF with the waterfowl hunt at FCSP. This support will include providing parking on the Refuge to those hunting at FCSP. As explained with the deer hunt, we will fully analyze the potential of adding waterfowl hunting through a complete and separate NEPA analysis. The refuge intends to begin this analysis within 3 years of CCP approval.

Strategies:

Continue to:

- Conduct law enforcement patrols to ensure no migratory bird hunting is occurring.

- Replace proclamation boundary markers to delineate the boundary.

- Provide environmental education in support of the objective.

Within 3 years of plan's approval:

- Fully analyze the potential of adding waterfowl hunting through a complete and separate NEPA analysis. The refuge intends to begin this analysis within 3 years of CCP approval.

- Work with VDGIF to assist with implementing a waterfowl hunt at Redhead Bay. Blind stakes will be located at three sites (Map 4-3).
- Implement a limited waterfowl hunt at Frank Carter impoundments in partnership with VDGIF.
- Support VDGIF with waterfowl hunt at FCSP by providing parking at Refuge

Objective 6c. Fishing

Within 5-7 years of CCP approval, expanding high-quality fishing opportunities on the Refuge.

Rationale for Objective

During the Refuge expansion proposal in the 1990's, the Refuge promised to work with the City of Virginia Beach to provide additional public access to Back Bay for uses compatible with Refuge purposes. There are limited shoreline public access points on Back Bay. As part of our efforts to expand priority public uses, in cooperation with the City of Virginia Beach and VDGIF, we will provide enhanced fishing access at Hell's Point Creek and Beggars Bridge Creek. As was discussed under Goal 5, we will develop these two multiple use sites (please refer to objectives under Goal 5 for additional information). As stated earlier, we will develop a low-impact canoe/kayak launch ramp (where one could fish from), an 8 to 12 car parking lot (unless it's already present) and a restroom.

We will expand the number of fishing education events that we have on the Refuge. We will have one additional fishing education event per year, thus making a total of two fishing education events per year (See Rationale under Goal 5). The second event, to be hosted in the spring, will be coordinated and co-hosted with VDGIF. This event would be more like a workshop, with a registration fee, and include education on aquatic ecology, fish biology, angling techniques and non-native species. Also, the event would allow attendees to fish and compete for prizes (i.e. fishing derby).

We define a high-quality fishing opportunity as one that:

- Maximizes safety for anglers and visitors;
- Causes no adverse impact on populations of resident or migratory species, native species, threatened and endangered species, or habitat;
- Encourages the highest standards of ethical behavior in regard to catching, attempting to catch, and releasing fish;
- Is available to a broad spectrum of the public that visits, or potentially would visit, the Refuge;
- Provides reasonable accommodations for individuals with disabilities to participate in Refuge fishing activities.
- Reflects positively on the System;
- Provides uncrowded conditions;
- Creates minimal conflict with other priority wildlife-dependent recreational uses or Refuge operation;
- Provides reasonable challenges and harvest opportunities; and

- Increases the visitors' understanding and appreciation for the fisheries resource.

Strategies:

Continue to:

- Allow visitors to fish along the beach, the shore of the bay, and from the D Pool impoundment.
- Work with partners to provide fishing education programs, and instill a conservative recreational fishing ethic through the National Fishing Week special event and other events.
- Complete development of the Horn Point site to provide additional fishing opportunities.
- Provide limited, night surf fishing opportunities through special use permits.

Within 1 year of CCP approval:

- Expand fishing education events at the Refuge to 2 events per year.

Within 5-7 years of CCP approval:

- Provide fishing access at the Hell's Point Creek and Beggars Bridge Creek sites as described earlier.

GOAL 7. **Promote understanding and appreciation for the conservation of fish, wildlife and their habitats and the role of the Refuge in this effort through effective community outreach programs and partnerships.**

Objective 7a. Partnerships With current partners, identify and implement new initiatives and opportunities in interpretation, environmental education, maintenance, habitat enhancement and protection, law enforcement, hunting, and fishing.

Rationale for objective

These objectives would encourage broader cooperation between the Service and local communities, interest groups, and other agency partners. As an urban Refuge with limited internal resources, partnerships are readily available and key to accomplishing Refuge goals and objectives. Further, the Service can be a resource to the community in providing valuable technical **assistance to** area conservation groups. Sharing resources where mutually compatible conservation objectives are apparent is cost-effective, and in the best interest of the Service, the partner organization, and the public.

Strategies:

Continue to:

- Maintain partnership with Ducks Unlimited, an important partner in wetland and waterfowl conservation.

- We will continue to work closely with VA DGIF to develop specific wildlife and fisheries management strategies, protect listed species and valuable resources, and manage hunting and fishing programs.

- Work with FCSP personnel to patrol the Refuge and the Park's beaches for sea turtle nests during the summer. Also, we would cooperate with FCSP on law enforcement efforts, interpretative programming, and special events management and staffing.

- Manage FCSP's two impoundments, including water level management, invasive species control, mechanical habitat management, and prescribed burning.

- Hold annual deer and feral hog hunts simultaneously with FCSP on the Barrier Island.

- Provide assistance to Mackay Island National Wildlife Refuge.

- Have BBRF collect bimonthly water quality data at six selected sites along the western side of Back Bay. We would also partner with BBRF for environmental education, programming, biological issues, and special events.

- Have the Friends of Back Bay NWR group work with Congress to advocate for Refuge land acquisition.

- Recruit, train, and utilize volunteers in public use, biology and maintenance programs.

- Participate in meetings of the Carolina Virginia Strategic Habitat Conservation Team.

Within 2 years of CCP approval:

- Work with False Cape State Park to monitor and assess the effects of natural dune succession and dune swale plant community changes.

- Work with Ducks Unlimited to redevelop impoundment management at the Frank Carter impoundments.

- Pending results of the SAV study, examine and implement best sites for SAV restoration and best restoration technique. Partners could include the Virginia Department of Environmental Quality, Department of Conservation Resources, US Geological Survey, US Army Corp of Engineers, Department of Transportation, US Environmental Protection Agency (EPA), Virginia Institute of Marine Services, and a variety of agencies connected with the North Carolina Department of Environment and Natural Resources.

- Work with partners to treat phragmites areas on private lands immediately adjacent to Refuge property

- Continue to work with partners and the Corps of Engineers in the feasibility study to restore the Albermarle-Pamlico Esturine System, including Currituck Sound and Back Bay.

Within 5 years of CCP approval:

- Complete a Cooperative Management Agreement with the City of Virginia Beach for enhanced law enforcement service, including increased patrol coverage of Refuge lands.

- Increase off-site environmental education programs by 20% over current levels.

Over the duration of this plan:

- The Refuge would support multi-use trails as proposed by the City of Virginia off of Refuge lands that are also compatible with Refuge purposes.

Objective 7b. Individual and Volunteerism Opportunities

Within 2-5 years of CCP approval, increase Refuge volunteerism hours by 5 to 10% to enhance visitor service, maintenance, habitat management, and resource protection efforts.

Rationale for Objective

The expansion of visitor facilities and services, as well as the projected increase in visitation, would require additional staffing support to meet public expectations, and provide for public safety, convenience, and a high quality experience for Refuge visitors. Current staffing projections for the foreseeable future appear constrained, and are not expected to change with the addition of new facilities. Partnering, interagency agreements, service contracting, internships, and volunteer opportunities will increase in order to provide this staffing support.

Strategies:

Within 2 years of plan's approval:

- Increase volunteer hours by 5% over current levels through proactive recruitment, enhanced outreach, and increased opportunities on the Refuge.

- Recruit a volunteer to help manage the volunteer program.

- Integrate volunteer program with other Refuge support groups, including but not limited to Back Bay Restoration Foundation (BBRF), "Reese's Pieces," Friends, and work campers.

Within 5 years of plan's approval:

- Increase Refuge volunteer hours by 10% over current levels through proactive recruitment, enhanced outreach, and increased opportunities on the Refuge.

Objective 7c. Public Use Facilities

Within 10 years of CCP approval, expand and/or replace existing public use facilities (identified in table 3.9. Refuge Infrastructure, in Chapter 3), and adjust current. VCS operating schedule to provide for enhanced visitor services and accommodate an anticipated minimum 10% visitation increase over the period.

Rationale for Objective

This objective would provide for safe and convenient access to Refuge resources in order to promote public education and understanding of resource values. We must maintain our public use infrastructure to provide a "go to" location to get questions answered and host public use events on the Refuge.

Strategies

Continue to:

- Maintain the current Office/Visitor Contact Station and maintenance compound at the barrier island in Sandbridge.

- Maintain the ABCEEC as the primary environmental education site and office space for BBRF

- Keep Visitor Contact Station open from 8am-4 pm on Monday-Friday (year round), 9am-4pm Saturday & Sunday (April 1 through October 30); closed Saturdays (November 1 through March 31) and closed all federal holidays except Memorial Day, Independence Day, and Labor Day.

Within 1 year of CCP approval:

- Change VCS operating schedule – Close Sundays instead of Saturday from November 1 through March 31. We would continue to operate 7 days per week from April 1 through October 31, including being open on the 3 major summer holidays (Memorial Day, Independence Day, and Labor Day).

  Utilize Rightmier House as temporary office space until new Headquarters/ VCS is completed.

Within 5-7 years of CCP approval:

- Develop and design a new facility to serve as a refuge headquarters (Region 5 standard design for medium facility) VCS and EEC..

Upon completion of new Headquarters/VC, the following additional strategies are proposed:

- Evaluate option of operating new Headquarts/VC 7 days per week.

- Work with City of Virginia Beach to realign New Bridge Road (Note: This strategy can, and should, be done as part of the development, design and construction of the new HQ/VCS.)

- Utilize ABCEEC site as office and facility for maintenance. After the Rightmier House has been updated to be more energy-efficient and updated to meet electrical codes, it may be utilized by Refuge partners or staff as office space.

- Provide new office space for BBRF.

- Maintain and improve current office as primary visitor contact facility and possible sales outlet for cooperating association (BBRF).

Other Management Actions

These actions are not specific to any goals or objectives but will be completed within the 15 year comprehensive planning timeframe.

Refuge Step-Down Plans

The Refuge will complete these step-down management plans as shown:

- Habitat Management Plan (HMP)

The HMP is being written in conjunction with the CCP, and is expected to be finished in calendar year 2010. This Plan serves as an "umbrella document" under which other Refuge Habitat Plans operate, and will carry out the habitat goals and objectives of the CCP. The HMP will include marsh and water management, forest management, and cropland management.

- Inventory and Monitoring Plan (IMP)

An approved IMP exists for Back Bay NWR, but it needs amending/updating. Revisions will be completed within two years of the finalized HMP. A considerable number of inventory and monitoring strategies are included in Goals 1 and 4 of the CCP.

- Fire Management Plan (FMP)

An FMP (and accompanying EA) is in draft form and will be completed in 2011, as mandated by the Service. The Fire Plan will address wildland and prescribed fire events with guidelines on the level of protection needed to ensure safety, protect facilities and resources, and restore and perpetuate natural processes. This plan is expected to meet the needs of the Refuge for fire management.

- Hunting Plan

The 1998 Refuge Hunting Plan provides justification and the framework for the annual Refuge deer and hog hunt. The need for adequate, efficient controls on both deer and feral hog populations is explained in this Plan. Because of adoption of Virginia Department of Game and Inland Fish (VDGIF) Cyberdata hunter selection process, many administrative changes to Refuge Hunt operations have occurred which required that this Plan be amended. An amended version was completed and approved in July 2006. In the proposed action, we propose to fully analyze the potential of adding waterfowl hunting and expanding the area of deer and hog hunting through a complete and separate NEPA analysis. The refuge intends to begin this analysis within 3 years of CCP approval. We will need to work closely with the state to pull together data necessary to complete this analysis.

- Integrated Disease Prevention and Control Plan

This Plan was amended and approved in January 2007. It is a comprehensive plan that includes recent concerns about avian influenza, West Nile virus and chronic wasting disease.

- Public Use Plan

This Plan was amended and approved in 1990, with addendums in 1992 and 1994. Updating this plan is required to account for approved changes in the final CCP. Revisions will be completed within 3 years of CCP approval, and will be consistent with recent visitor services policies developed by the Service.

Cultural Resources

- Within 5 years of CCP approval, develop a study comparable to the 1989 Goodwin report for lands subsequently acquired and within the acquisition boundary. This will assist refuge management, especially in: avoiding inadvertent facility location and impact of habitat work on areas sensitive for archaeological sites; helping to avoid inadvertent acquisition of historic

structures; identifying Archaeological Resources Preservation Act (ARPA) law enforcement issues; and broadening the Refuge's potential historic interpretation coverage to the Pungo area.

- Within 5 years of CCP approval, establish ARPA training for refuge officers, proactive development of an ARPA response team (law enforcement officers, archaeologist, and Assistant United States Attorney), and site monitoring during normal law enforcement rounds. Monitor the Bay Trail site, and consider slight relocation of the trail to avoid the historic site in the long term.

- With 5-8 years of CCP approval, develop a program of monitoring, assessment, and protection and/or data recovery of sites susceptible to erosion.

- Within 5-7 years of CCP approval, upgrade the storage and security of the antique waterfowling equipment collection. If a new facility is built or the existing facility upgraded, security, climate control, storage, and display of this collection will be included in design of the facility.

- Within 8 years of CCP approval, develop a shipwreck site reporting and study protocol. Thanks to effective and timely professional networking among maritime archaeologists, studies of storm-revealed wreck sites here and elsewhere in the region have been valuable. These studies have always been performed gratis by United States Navy (USN), National Oceanic and Atmospheric Administration (NOAA), and State Historic Preservation Office (SHPO) staff, as well as academic professionals and maritime archaeological societies. These wrecks are a trust resource, just as are the terrestrial sites; however, the most effective treatment of them is to monitor their locations, study them as they appear, and recover them with beach material if they are at risk of further erosion, looting and/or damage by visitors. A systematic and proactive team approach would be beneficial to handing this issue at Back Bay, as well as at other refuges where historic wrecks appear. A Regional Memorandum of Understanding (MOU) , or series of MOUs, with agencies and institutions called to study wrecks would be an ideal approach—potentially including a mechanism for reimbursement of such partners for expenses incurred, or in-kind services such as temporary housing or on-refuge transportation in refuge vehicles or boats.

Under this action we will continue to manage Refuge facilities trails and other recreational assets, and equipment. Management of facilities and equipment includes wetlands renovation, repair and maintenance of impoundment dikes, water control structures, pump station, canoes, boats and motors, docks, boat ramps and heavy equipment. In order to work on forested land that is located six to ten miles from the headquarters, the Refuge must also maintain and transport vehicles, tools (power and hand), and heavy equipment.

- Allot an annual budget of at least $32,000 (FY 07 dollars) for facilities and equipment maintenance.

When implementing construction projects, we will adhere to the following best management practices:

- Use, where possible, of water for dust control

- Covering of open equipment for conveying materials

- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

- Grounds should be landscaped with hardy native plant species to conserve water as well as minimize the need to use fertilizers and pesticides.
- Convert turf to low water-use landscaping such as drought resistant grass, plants, shrubs and trees.
- Low-flow toilets should be installed in new facilities.
- Consider installing low-flow restrictors/aerators to faucets.
- Improve irrigation practices by upgrading with a sprinkler clock; watering at night, if possible, to reduce evapotranspiration; installing a rain shutoff device; and collecting rainwater with a rain bucket or cistern system with drip lines.
- Consider replacement of old equipment with new high-efficiency machines to reduce water usage by 30-50 percent per use.
- Check for and repair leaks (toilets and faucets) during routine maintenance activities.
- Operate machinery and construction vehicles outside of stream-beds and wetlands; use synthetic mats when in-stream work is unavoidable.
- Preserve the top 12 inches of material removed from wetlands for use as wetland seed and root-stock in the excavated area.
- Place heavy equipment, located in temporarily impacted wetland areas, on mats, geotextile fabric, or use other suitable measures to minimize soil disturbance, to the maximum extent practicable.
- Restore all temporarily disturbed wetland areas to pre-construction conditions and plant or seed with appropriate wetlands vegetation in accordance with the cover type (emergent, scrub-shrub or forested). The applicant should take all appropriate measures to promote re-vegetation of these areas. Stabilization and restoration efforts should occur immediately after the temporary disturbance of each wetland area instead of waiting until the entire project has been completed.
- Place all materials which are temporarily stockpiled in wetlands, designated for use for the immediate stabilization of wetlands, on mats or geotextile fabric in order to prevent entry in state waters. These materials should be managed in a manner that prevents leachates from entering state waters and must be entirely removed within thirty days following completion of that construction activity. The disturbed areas should be returned to their original contours, stabilized within thirty days following removal of the stockpile, and restored to the original vegetated state.
- All non-impacted surface waters within the project or right-of-way limits that are within 50 feet of any clearing, grading or filling activities should be clearly flagged or marked for the life of the construction activity within that area. The project proponent should notify all contractors that these marked areas are surface waters where no activities are to occur.
- Measures should be employed to prevent spills of fuels or lubricants into state waters.

- Maintain undisturbed wooded buffers of at least 100 feet in width around all onsite wetlands and on both sides of all perennial and intermittent streams

- Prior to implementation, erosion and sedimentation controls would be designed in accordance with the most current edition of the Virginia Erosion and Sediment Control Handbook. These controls would be in place prior to clearing and grading, and maintained in good working order to minimize impacts to state waters. The controls would remain in place until the area is stabilized.

We will continue to encourage and support research and management studies on Refuge land that are relevant to approved Refuge objectives. The Refuge will also consider research for other purposes that may not be directly related to Refuge-specific objectives, but contribute to the broader enhancement, protection, use, conservation, and management of native populations of fish, wildlife and plants, and their natural diversity within the region. All researchers will be required to submit a detailed research proposal following the guidelines established by Refuge staff. Refuge biologists and other Service staff will be asked to review and comment on research proposals. Special use permits will identify the schedules for progress reports, the criteria for determining when a project would cease and the requirements for publication or other final reports. All publications will acknowledge the Service and the role of Service staff in the particular research project.

- Encourage and support research and management studies unrelated to Refuge objectives, but which contribute to protection, use, conservation, and management of native populations of fish, wildlife and plants. Continue to participate with VDGIF in their study of feral hog natural history, population, and habitat use.

- Encourage and support research and management studies on Refuge land that are relevant to approved Refuge objectives.

Refuge Fee Program

- Collect an entrance fee from April through October and then suspend fee collection from November through March. The entrance station provides a checkpoint to inform about appropriate resource use and protection, and to provide another source for visitor information. Funds generated from the fee collection program are used to provide revenue enhancement for public use facility operation and maintenance, as well as for various habitat management projects that offer public use opportunities.

- Serve as a sales outlet for Federal Recreation passport sales, including the Service Duck Stamp.

Beach Permittee Program

For many years, Back Bay NWR was open to vehicular beach access and use by the general public. In 1969, with visitation reaching 348,000 yearly, it became evident the increased Refuge and beach use had resulted in environmental degradation and a serious conflict of the Refuge's intended purpose. In 1972, the Refuge beach was closed to all unauthorized vehicular traffic. In 1973, after a final ruling in the Federal Register, permits were issued for vehicular beach use only to property owners and businesses south of Back Bay NWR up to a point 1,600 feet south of the Currituck Lighthouse in North Carolina. These permits were issued to individuals providing proof of residency and

businesses that required need for beach access to reach Virginia as recreational traffic was prohibited. All permits are grandfathered back to the Refuge and are not transferable after use is no longer needed, or after the permittee no longer meets the permit guidelines. Originally, approximately 100 permits were issued. That number has slowly dropped to the present day of 15 residential, 5 commercial, and 9 cooperator permits. No new permits may be authorized, so as permits expire, the number of permits will continue to decrease through attrition of this Refuge activity. The Refuge does however allow vehicular beach access use to co-operative agencies such as law enforcement and fire and rescue operations that can show a direct need for beach access. Under all of the alternatives, we would continue phasing out Refuge Motor Vehicle Access (MVA), according to the Federal law, to minimize erosion impacts of oceanfront beaches and lost shorebird use during spring and fall migrations. We would continue to authorize existing permits for vehicular beach access to only property owners and businesses south of the Refuge up to a point 1,600 feet south of the Currituck Lighthouse in North Carolina.

Law Enforcement

All of the alternatives would maintain the Refuge's proactive law enforcement program. This program would enforce Federal, State, and local laws. Primary enforcement efforts concentrate on the protection of natural resources and enforcing the Refuge specific regulations, through proprietary jurisdiction. The Refuge law enforcement program also provides for the safety of those individuals who visit the Refuge.

- Close seasonal dike trails from November through March annually in order to prevent disturbance of wintering migratory waterfowl within the impoundments.
- Prohibit waterfowl hunting in the Presidential Proclamation area composed of 4,600 acres of bay waters and the impoundments (Note: Additional hunting strategies are covered in Goal 6).
- Conduct regular law enforcement patrols for visitor and resource protection.
- Patrol Refuge property along with Virginia Beach Police and State Officers, primarily from False Cape State Park (FCSP). Virginia State Conservation Officers also enforce State regulations on the Refuge.
- Open the Refuge to visiting public from one-half hour before sunrise to one-half hour after sunset every day of the year, except during the annual hunt in October. Provide law enforcement coverage during the October night surf fishing season.
- Prohibit non-wildlife dependent activities such as sunbathing, surfing, picnicking, and swimming. Dog-walking is prohibited in certain areas for all alternatives, and is eliminated in Alternatives B and C.

Refuge Partnerships

Maintaining partnerships with various state, local and private agencies and organizations plays a very important part in the continued success of Refuge management. Refuge partnerships provide assistance in conducting Refuge inventories and surveys, advocacy for Refuge funds, and maintenance of communication and contact with the community. All of the alternatives would continue to maintain and enhance the Refuge's current partnerships.

Refuge Revenue Sharing

As described in Chapter 3, the Service pays Virginia Beach refuge revenue sharing payments based on the acreage and value of refuge land in their jurisdiction. The payments are calculated by formula, and funds are appropriated

by Congress. All of the alternatives will continue those payments in accordance with the law, commensurate with changes in the appraised market values of refuge lands or new appropriations by Congress.